



Puyallup Tribe of Indians



April 22, 2016

Via E-Mail

Becca Conklin
Department of Ecology
PO Box 47600
Olympia, WA 98503-7600
swqs@ecy.wa.gov

RE: Puyallup Tribe of Indians' Comments RE: 2016 (Proposed) Water Quality
Standards for Surface Waters of the State of Washington—Chapter 173-201A
WAC (WQS)

Dear Ms. Conklin:

Attached are the Puyallup Tribe's Comments on Ecology's 2016 (Proposed) Water Quality Standards for Surface Waters of the State of Washington—Chapter 173-201A WAC (WQS) ("the Proposed Rule"). As a co-manager of the fishery and regulator of water quality within the 7 miles of the 1873 Survey Area of the Puyallup Reservation, drafting human health standards that "are set at levels that will adequately protect Washington residents, including tribes with treaty protected rights, from exposure to toxic pollutants" is vitally important to us. 80 Fed. Reg. 55063.

Essential to setting levels that are sufficiently protective of all citizens of Washington State that consume fish, we agree with Ecology's proposed use of a fish consumption rate (FCR) of *at least* 175 grams per day and a cancer risk level of 10^{-6} (one excess cancer in a million). However, we also agree with EPA that an FCR of 175 grams per day does not reflect unsuppressed consumption rates of Tribes or heritage rates within the State of Washington. The proposed water quality standards at issue in these comments are required under the Clean Water Act to protect the most sensitive applicable uses in Washington's waters, which include the tribes' reserved rights to take fish for subsistence, ceremonial, religious and commercial

purposes in Usual and Accustomed fishing places.

The Puyallup Tribe, a sovereign nation, signed the Treaty of Medicine Creek, 10 Stat. 1132 (1855), with the United States reserving rights to harvest fish and other natural resources both within and outside of its reservation boundaries. The Treaty Right of the Puyallup Tribe to harvest fish both within and outside reservation boundaries was re-affirmed in the 1974 decision in *U.S. v. Washington*, 384 F.Supp. 312, (W.D. Wash., 1974). For time immemorial, the Puyallup Tribe has fished the waters both within and outside its current reservation boundaries as a subsistence fishery, with the salmon being a traditional food source and cultural staple. The Tribe has a Treaty Right to fish and consume fish that are safe for consumption. The resulting Proposed Rule fails to reach any reasonable protection that demonstrates the States acknowledgment of, much less protection of, the Tribe's Treaty Rights. Finalizing the Proposed Rule without significant revisions will result in a violation of the Tribe's Treaty Rights.

Furthermore, the Tribe is both disappointed and frustrated that Washington's proposed rule has failed to do all it can and is obligated to do under the Clean Water Act to protect the health of Tribal members and Washington citizens. There certainly has been ample opportunity to make revisions that reflect best available science, based on recent publication of EPA's Revision of Certain Federal Water Quality Criteria Applicable to Washington (September 14, 2015, "Draft Federal Rule") and finalization in August 2015 of EPA's 304(a) Nationally Recommended Criteria. Tribal scientists have worked tirelessly with the State Department of Ecology to analyze the best available science to arrive at criteria that would protect the health of people as required under the Clean Water Act. Yet that work has largely been displaced and disregarded because in the end Washington has allowed politics to override sound science and interfere with its obligations to base this rule upon the best available science and obligations set forth in the Clean Water Act.

While the attached technical comments will provide the details of the inadequacies of the proposed rule and provide science based recommendations in detail, the State has failed, by letting political pressures by those who stand to reap purely economic benefit from weaker pollution protections, to offer human health criteria and, therefore, enforceable water quality standards, that meet today's best available science based requirements to ensure the state's citizens are protected from pollution in our waters. The State has attempted to offer a more reasonable, albeit still inadequate, fish consumption rate as an indicator that it is strengthening protections for people and fish. It also has reconsidered, after discussions with EPA and others, to change the cancer risk rate in the existing standards to a less protective level. However, at the

same time, most of the gains achieved in protection have been nullified by adjusting other inputs that go into the derivation of the standard (i.e. relative source contribution). The State's arbitrary and capricious actions have not gone unnoticed by Tribes, citizens, or the U.S. Environmental Protection Agency.

In addition to the proposed human health criteria lacking the strength to provide acceptable and measurable improvements to the water quality we all depend upon, the State proposes going even further in allowing polluters "off ramps" from meeting water quality standards for undetermined periods of time, through undefined variances, from compliance with the already weak standards through implementation tools that are ambiguous at best, leaving open the possibility that polluters will escape compliance all-together resulting in continued long-term degradation and pollution of already impaired waters. So too does the State abdicate its responsibility to address some of the most persistent and dangerous chemicals in our waters – PCB, methylmercury, and arsenic. This is a wholly unacceptable concession to Washington's most egregious polluters. With ever increasing pollution loads and resulting impacts, tribal people and the fishery don't have the time to wait for the State to get it right. (See Russ Ladley's analysis of the Coho Run, attached at the end of this cover letter for reference.) To prevent the non-attainment of water quality standards and full exercise of treaty reserved rights in our watershed, the Tribe will oppose any and all variances.

Again, while the Tribe appreciates the opportunity to comment on the Proposed Rule, the Tribe requests that the State of Washington (or EPA) finalize a substantially more protective rule that uses best available science to meet the State's obligations under the Clean Water Act as fully described in the attached comments. We offer the following comments in support of our request. The Puyallup Tribe further adopts and incorporates by this reference, the comments submitted by the Northwest Indian Fisheries Commission.

Sincerely,



Char Naylor,
Puyallup Tribal
Water Quality Manager



Puyallup Tribe of Indians



Puyallup Tribe's Comments On and Recommendations For Revisions to the Department of Ecology's 2016 (Proposed) Water Quality Standards for Surface Waters of the State of Washington—Chapter 173-201A WAC (WQS)

Introduction

This document contains the basis for the Puyallup Tribe's comments on and recommendations to revise the Draft 2016 Department of Ecology's (Proposed) Water Quality Standards for Surface Waters of the State of Washington – Chapter 173-201S WAC (the "Proposed Rule") which sets out human health criteria to be used in Washington's water quality standards and implementation tools. In addition to specific citations herein, please see the attached list of references and documents submitted along with this document. Specifically, we are providing the methodology and input variables recommended by the Tribe in the derivation of the human health criteria; recommendations for the so-called problem toxics, including arsenic, mercury, and PCBs; recommendations for implementation tools including variances, compliance schedules and intakes credits; and protection of downstream uses.

The guiding principles forming the basis of the Puyallup Tribe's recommendations are:

1. To use the comprehensive body of technical information, policy and guidance available as developed by the agency with expertise in the derivation of water quality standards that are sufficiently protective of human health.
2. To use local and regional data or guidance where available to reflect local conditions and protect highly exposed populations, including tribes.
3. To protect the treaty right of the Puyallup Tribe to take fish in all Usual and Accustomed fishing areas.
4. To protect the health of *all tribal members* of the State of Washington, whose Usual and Accustomed fishing areas

comprise most of the waters of Washington State.

5. To protect downstream designated uses within the boundary of the Puyallup Reservation, in which the Tribe regulates water quality, as approved by EPA in 1994. Downstream uses of water designated by the Tribe include, but are not limited to, the use of water for the purposes of ceremony.
6. To protect a key function of the Tribe's and Washington's economy which necessitates our ability to catch and sell fish that are not contaminated with toxic pollutants.
7. To protect access to traditional foods for ceremonial, religious and sustenance purposes, but also for preventing health ailments associated with non-traditional diets such as diabetes, heart attack and stroke.

The Puyallup Tribe, a sovereign nation, signed the Treaty of Medicine Creek, 10 Stat. 1132 (1855), with the United States reserving rights to harvest fish and other natural resources both within and outside of its reservation boundaries. The Treaty Right of the Puyallup Tribe to harvest fish both within and outside reservation boundaries was re-affirmed in the 1974 decision in *U.S. v. Washington*, 384 F.Supp. 312, (W.D. Wash., 1974). For time immemorial, the Puyallup Tribe has fished the waters both within and outside its current reservation boundaries as a subsistence fishery, with the salmon being a traditional food source and cultural staple. The Tribe has a Treaty Right to fish and consume fish that are safe for consumption.

The Clean Water Act requires Washington to promulgate water quality standards that protect designated uses of water. 33 U.S.C. §1313. In developing water quality standards, Washington is required to include criteria that are often numeric and are necessary to ensure designated uses are attained and protected. These uses are often referred to as fishable and swimmable uses, which include providing water from which people can drink, consume fish, and recreate safely. 40 C.F.R. § 131.10(a). Federal regulations require Washington State's water quality criteria to be based on sound scientific rationale and must contain sufficient parameters or constituents to protect designated uses. 40 C.F.R. §131.11(a). If Washington fails to develop adequate water quality standards then the Environmental Protection Agency ("EPA") must step in and develop the required standards in a timely manner. 33 U.S.C. § 1313. The Tribe's

comments and recommendations herein are based on the existing most current scientific evidence, policy, guidance, and court decisions.

Under the Clean Water Act, the fishing use includes the ability of people to harvest fish and shellfish that are safe to use in the amounts those people would normally consume. *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 822-B-00-004 (2000), available at: <http://www.epa.gov/waterscience/criteria/humanhealth/method/complete.pdf> (“2000 Methodology”). This requirement coexists with the Puyallup Tribe’s Treaty right to harvest fish and shellfish that are safe for consumption at the rate at which the Puyallup Tribe has historically consumed those fish and shellfish. A recent decision by the EPA reaffirms this requirement, finding that in evaluating a state’s water quality standards and associated human health criteria, EPA must evaluate whether the proposed criteria are adequate to protect fishing rights of tribes. *Analysis Supporting EPA’s February 2, 2015 Decision to Approve, Disapprove, and Make No Decision on, Various Maine Water Quality Standards, Including Those Applied to Waters of Indian Lands in Maine*, U.S. Environmental Protection Agency, Office of Water. February 2, 2015. Available at: <https://turtletalk.files.wordpress.com/2015/02/2015-2-2-me-wqs-epa-decision-letter-attachment-a.pdf> (“Maine Decision”).

Statutory and Regulatory Background

Over two decades have passed since EPA established Washington’s existing criteria for the protection of human health under the National Toxics Rule (NTR). The Agency’s recommended criteria values were promulgated at that time. EPA established chemical specific, numeric criteria for 85 priority toxic pollutants for Washington and 13 other states and territories that were not in compliance the requirements of CWA section 303(c) (2)(B). Washington has not adopted its own criteria for the protection of human health and, and thus the applicable criteria that EPA promulgated Back in 1992 remain applicable to waters of the State.

In June of 2015, EPA updated the 1993 National Toxics Rule (NTR) by publishing a final rule that included national recommended ambient water quality criteria (AWQC) for human health for 94 chemical pollutants (80 Fed. Reg. 36986 (June 29, 2015)). As the agency with expertise and regulatory authority, under the Clean Water Act section 304(a), EPA publishes criteria recommendations for states to consider when adopting water quality criteria for particular pollutants to meet the CWA section 101(a)(2) “swimmable, fishable

goals”. If states modify these criteria to reflect local conditions or use other methodologies, these criteria must protect the designated use and be based on sound scientific rationale (40CFR 131.11(a)(1)).

EPA’s human health criteria reflect the most up-to-date science as well as implementation of existing EPA policies found in *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000). In turn, this document provides the foundation and guidance in deriving the most recent criteria. EPA’s new human health criteria also reflect updated body weight information, drinking water consumption rate, fish consumption rate, bioaccumulation factors, health toxicity values, and relative source contribution.

EPA’s recommended Section 304(a) criteria provide the most recent technical information for states and authorized tribes to consider and use in adopting water quality standards that ultimately provides the basis for assessing water body health and controlling discharges of pollutants into waters of the United States. Although states and authorized tribes are not required to use these criteria, they *are* required to ensure the protection of all applicable designated uses as well as provide a scientific rationale for all criteria in their proposed water quality standards. A key part of protecting the designated use is updating all the factors or parts of the equation used to derive criteria. That is, updating all the “sufficient parameters or constituents to protect the designated use”, as required by the federal water quality standard regulation. 40 CFR 131.11(a) EPA recently proposed revisions to its water quality standards regulation that *require* states during their triennial reviews to consider new or updated section 304(a) nationally recommended criteria, and if they do not adopt these criteria, provide an explanation as to why the state did not do so.

The Clean Water Act requires Washington to promulgate water quality standards that protect designated uses of water. 33 U.S.C. §1313. In developing water quality standards, Washington is required to include criteria that are often numeric and are necessary to ensure designated uses are attained and protected. These uses are often referred to as fishable and swimmable uses, which include providing water from which people can drink, consume fish, and recreate safely. 40 C.F.R. § 131.10(a). Federal regulations require Washington State’s water quality criteria to be based on sound scientific rationale and must contain sufficient parameters or constituents to protect designated uses. 40 C.F.R §131.11(a). If Washington fails to develop adequate water quality standards then the Environmental Protection Agency (“EPA”) must step in and develop the required standards in a timely manner. 33 U.S.C. § 1313.

EPA Federal Rule Promulgation

On January 12, 2015, after over a decade of delay and constant urging by EPA, tribes and citizens, Ecology finally proposed revised human health criteria water quality standards for Washington State's surface waters. This was after EPA made a Determination of Necessity under 33 U.S.C. § 1313(c)(4)(B) that the State's existing standards were not protective of designated uses of waters in the State of Washington, including the Tribes' treaty rights to take fish.

In Section III(B) of the proposed draft rule, EPA makes the following statement regarding the CWA determination of necessity as required in CWA 303(c)(4)(B):

Because Washington's existing human health criteria, as promulgated by EPA in the NTR, are no longer protective of the applicable designated uses per the CWA and EPA's regulations at 40 CFR 131.11, EPA determines under CWA section 303(c)(4)(B) that new or revised WQS for the protection of human health are necessary to meet the requirements of the CWA for Washington. EPA, therefore, proposes the revised human health criteria for Washington in this rule in accordance with this 303(c)(4)(B) determination. (p. 55066)

The Puyallup Tribe commented extensively on the proposed federal rule in December, 2015. Our comments are mostly incorporated herein by reference. In determining whether water quality standards comply with the Clean Water Act and EPA's regulations, other applicable laws must be considered including federal treaties when setting criteria to support applicable designated uses in Washington waters. This includes the treaty-reserved right to take fish and the right not to be exposed to unacceptable levels of pollutants by eating those fish. EPA's draft Water Quality Rule explains:

In Washington, many Tribes hold reserved rights to take fish for subsistence, ceremonial, religious, and commercial purposes, including treaty-reserved rights to fish at all usual and accustomed fishing grounds and stations in waters under state jurisdiction, which cover the majority of waters

in the state. Such rights include not only a right to take those fish, but necessarily include an attendant right not be exposed to unacceptable health risks by consuming those fish. (p.55066)

EPA also determined that the federal human health criteria in the NTR applied to Washington no longer protected the relevant uses of Washington's waters based on the inadequacy of the fish consumption rate used in the state standards of 6.5 grams per day (no more than about a thimble full of fish per day). In 1992, EPA used national data available on the average per-capita consumption rate of fish from inland and near shore waters for the U.S. population to estimate an average fish consumption rate of 6.5 g/day. To update the woefully inaccurate rate for all of Washington's residents that consume considerably more fish than a thimble full per day of fish, peer-reviewed tribal consumption surveys and recreational angler rates reflect much higher levels of both fish and shellfish. The average FCR's from these surveys range from 63 to 214 grams per day (2.2 to 7.5 ounces per day). The 90th percentile from these surveys range from 3.9 113 to 489 grams per day (4.0 to 17.2 ounces per day). These numbers not only far exceed the current rate of 6.5 grams per day but also EPA's current national FCR of 22 grams per day, which represents the 90th percentile national FCR. The existing FCR not only doesn't account for newer local data from the tribes and others, but also EPA's guidance recommendations in the *2000 Human Health Methodology* to use an upper percentile of fish consumption data for the target population rather than the average. The Puyallup Tribe noted in its comments that studies of contemporary rates of fish consumption were not nearly representative of heritage or unsuppressed rates of fish consumption.

In addition to the use of regional fish consumption data, the Puyallup Tribe supported EPA's decision to update human health criteria for Washington using EPA's 304(a) Nationally Recommended Criteria that were updated in 2015. These criteria were developed by the agency with expertise (EPA) using the most recent and reputable science available today. By contrast, Washington State chose to selectively adopt only some of the revised criteria that were typically less protective. The EPA's federal rule provides more stringent criteria in about 80% of the pollutants included in the rule and therefore provides more protections of designated uses, including tribal reserved treaty rights to take fish in quantities safe for consumption.

The issuance of the proposed rule triggered EPA's duty to finalize a protective rule within ninety days. 33 U.S.C. § 1313(c)(4). EPA has not finalized a rule revising Washington's water quality standards, violating its mandatory duty under the Clean Water Act, 33 U.S.C. §

1313(c)(4). For that reason, the Puyallup Tribe has filed a 60-day notice under the CWA to urge EPA to fulfill its statutory duty to promulgate a final water quality standards rule.

On February 1, 2016, Ecology again proposed its own revised water quality standards and an accompanying package of discretionary implementation tools or flexibilities to allow polluters to not meet water quality standards. The proposed State's rule does not protect designated uses as required by the CWA, is not scientifically sound, is contrary to EPA guidance and is far less protective than the EPA proposed rule. While Ecology has proposed a 175 g/day fish consumption rate (a rate below what surveys show certain consumers such as members of Native American tribes eat) and protective 10^{-6} cancer risk rate, it uses other inputs selectively to weaken standards and is significantly under-protective for three of the most problematic pollutants in Washington State: mercury, arsenic, and PCBs. Similarly, the so-called implementation tools or allowances for polluters not to meet water quality standards would undo much of the progress made through the minimal strengthening of the underlying rule. Moreover these proposed tools would be far reaching, weakening compliance with other, existing water quality standards as well.

Treaty Reserved Rights and Washington's Designated Uses

The Puyallup Tribe is a signatory of the Medicine Creek Treaty. 10 Stat. 1132 (1855). The state is party to the treaty and has an obligation to not foreclose the ability of the Tribe to fully exercise the full extent of the treaty right. The exercise of this right is to take fish and safely consume fish throughout the Tribes Usual and Accustomed fishing areas for subsistence, ceremonial, and commercial purposes. The courts have defined the extent of these rights to include a 50% allocation of the fishery as necessary to prevent the Tribes a moderate standard of living *U.S. v. Washington*, 384 F.Supp. 312, (W.D. Wash., 1974). Because treaties are binding and the supreme law of the land, the state in the rulemaking process and EPA who will review and approve or disapprove these rules must not interfere with the full exercise of this right by both protecting the beneficiaries of the right (the consumers to safely consume fish) as well as the safety of the food source (the fishery) to ensure continued reliance to feed their families and secure a moderate living. *See Maine Decision*.

The Tribes' usual and accustomed fishing grounds throughout Washington State compromise a majority of the waters of the state and it is the duty of the state under the Clean Water Act to protect designated uses of these waters which include the fishing use. EPA determined in the recent Maine disapproval action that "to protect the function of these waters to preserve the Tribe's unique culture and to provide for the safe exercise of their sustenance

practices, EPA must interpret the fishing use to include sustenance fishing.” *Maine Decision* at 26. EPA determined it was their duty to include the concept of sustenance fishing as provided for in the tribal settlement acts, as to do otherwise “would run the risk that state WQS could be based on assumptions about fish consumption rates that could lead to criteria that fail to protect the Tribe’s ability to safely consume fish for their sustenance”. *Id.* at 32. Accordingly, EPA concluded that the State of Maine had a duty to protect the sustenance use. “To adequately protect the sustenance fishing use, EPA reasoned, the State of Maine was required to revisit two aspects of its technical analysis supporting the human health criteria that determine how clean waters must be to allow the Tribes to safely consume fish for their sustenance.” *Id.*

EPA continued that the State of Maine’s analysis must treat the tribal population exercising the sustenance fishing use as the target general population, not as a high consuming subpopulation of the State. *Id.* EPA guidance calls for WQS that provide a high level of protection for the general population, while recognizing that small subpopulations may face greater levels of risk. However, the Tribes are not a subpopulation using the waters on their own lands; they are the population for which that land base was established and set aside. Second, the data used to determine the fish consumption rate for tribal sustenance consumers must reasonably represent tribal consumers taking fish from tribal waters and fishing practices unsuppressed by concerns about the safety of the fish available to them to consume. The data on which the State relied to develop the fish consumption rates for the Maine water quality standards did not include information about the sustenance practices of tribal members fishing in their own water, nor did they represent consumption levels that were unsuppressed by concerns about pollution. EPA concluded that the best available data that represent the unsuppressed fishing practices of tribal members fishing in tribal waters are contained in the Wabanaki Lifeways study, which looked at the historic sustenance practices of the Tribes in Maine.” *Id.* at 39. Based on the Maine decision, Tribes in the State of Washington should be viewed by the State as *the target population for making risk management decisions, not a highly exposed subpopulation* as most the waters for which this rule applies throughout the state are Usual and Accustomed fishing grounds. The State of Washington, like in Maine, has a duty to protect the sustenance use in these waters so that tribal members can safely consume fish.

Thus, under the Clean Water Act, protecting the designated uses of Washington’s waters includes protecting the sustenance use. In the draft Federal Rule, EPA states:

EPA proposes to consider the tribal population exercising
their reserved rights in Washington as the target general

population for the purposes of deriving protective criteria that allow the tribes to harvest and consume fish consistent with their reserved rights. (p. 55067)

EPA further explains in the draft Federal Rule:

A majority of waters under Washington's jurisdiction are covered by reserve rights, including tribal reserved rights....Many areas where reserved rights are exercised cannot be directly protected or regulated by tribal governments and, therefore, the responsibility to the state and federal governments to ensure their protection. In order to effectuate and harmonize these reserved rights with the CWA, EPA determined that such rights appropriately must be considered when determining which criteria are necessary to protect Washington's fish and shellfish harvesting designated uses.... (p. 55067)

Thus in Washington, harvesting and consuming fish, including for subsistence purposes, is the designated use of most of Washington's waters that the Clean Water Act requires protection. Many toxic pollutants at issue in this rulemaking are persistent, carcinogenic, and/or accumulate in fish and shellfish tissue through biomagnifying up the food chain. This is a grave concern because low levels of bioaccumulative pollutants in surface waters can result in concentrations in fish tissue that can pose a human health risk.”), available at <http://water.epa.gov/scitech/swguidance/standards/handbook/chapter03.cfm#section13,m>.

When setting the human health water quality criteria for toxic pollutants, regulators must determine the amount of fish people actually consume. EPA has made clear that states must use locally-accurate and protective fish consumption rates to set water quality standards. *See, e.g.*, EPA, Methodology for Deriving Ambient, Water Quality Criteria for the Protection of Human Health at 2-13 (Oct. 2000) (“EPA 2000 Guidance”). Accurately determining the fish consumption rate is integral to regulators’ ability to set protective human health water quality standards such that the level of toxic pollutants are low enough that fish remain safe to eat, even for people who eat greater amounts of fish than others. *Id.*; *see generally* National Environmental Justice Advisory Council, Fish Consumption and Environmental Justice at 30-32 (Dec. 2001); *see also*, Maine Letter at 2-3 and 37-42. If a state sets the FCR lower than the amounts actually consumed, the human health water quality standards will not be protective for people consuming fish may ingest levels of toxins that will put them at increased risk for adverse health

consequences. EPA 2000 Guidance. Failure to adopt human health water quality standards based on an accurate fish consumption rate, including a rate adequate to protect sustenance fishing by tribes and other cultures, is a failure to promulgate water quality standards that meet the requirements of the Clean Water Act.

Other components of the human health water quality standards equation are also critical to ensuring adequately protective standards, and must have sufficient rationale for their derivation. As important as the fish consumption rate is the acceptable cancer risk rate, or the “near zero” level recommended by EPA. The “near zero” level in Washington State has been set at 10^{-6} , a one in one million chance that the average fish consumer will get cancer sometime in his/her lifetime from eating fish . A 1×10^{-6} risk factor is generally considered protective by EPA. 40 C.F.R. § 131.36(b)(1). *See also* Maine Letter at 3.

Finally, there are several additional inputs that affect the outcome of the human health criteria equations for carcinogens and non-carcinogens, including body weight, relative source contribution or how much of the toxic pollutant loads come from fish relative to all other sources (the “relative source contribution” number), and the use of bioconcentration or bioaccumulation factors. Ecology has largely ignored the science of these “sufficient parameters or constituents (to protect the designated use” by often relying on state “risk management decisions” to the detriment of the protection of the public, including tribal members.

DERIVATION OF HUMAN HEALTH CRITERIA FOR NON-CARCINOGENS

The human health criteria equation for non-carcinogens is as follows:

<p>AWQC =</p> <p>where:</p>	$\frac{RfD \cdot RSC \cdot \frac{BW}{DI + (FCR \cdot BAF)}}{[DI + (FCR \cdot BAF)]}$
<p>AW</p> <p>Rf</p> <p>RS</p> <p>BW</p> <p>DI</p> <p>FC</p> <p>BA</p>	<p>Ambient Water Quality Criterion (milligrams per</p> <p>Reference dose for noncancer effects (milligrams</p> <p>kilogram per day)</p> <p>Relative source contribution factor to account for</p> <p>water sources of exposure (unitless)</p> <p>Human body weight (kilograms)</p> <p>Drinking water intake (liters per day)</p> <p>Fish Consumption Rate (kilograms per day)</p> <p>Bioaccumulation factor (liters per kilogram)</p>

10

PTI recommends the State use the most recent reference doses used in EPA's IRIS database and 2015 § 304(a) Nationally Recommended Criteria for both the "water + organism" and "organism only" criteria for non-carcinogens. *Draft Nationally Recommended Water Quality Criteria*, U.S. EPA, Office of Water, Washington D.C. Last updated on December 3, 2014. Available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable> ("Draft Criteria"). The reference dose is EPA's maximum acceptable oral dose of a toxic substance, without the risk of "deleterious effects" over a lifetime. It is specific to the individual pollutant. EPA's 2000 Human Health Methodology recommends deriving human health criteria using the reference dose. *2000 Methodology*.

Body Weight

ADULTS

Ecology proposes 80 kilograms (176 pounds) for the body weight assumption to derive human health criteria. This value is based on updated survey data and is consistent with the average adult body weights of the Tulalip and Suquamish Tribes. *Region 10 Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia*, U.S. Environmental Protection Agency, 2007, Working Doc. Available at: [http://yosemite.epa.gov/r10/CLEANUP.NSF/7780249be8f251538825650f0070bd8b/e12918970debc8e488256da6005c428c/\\$FILE/Tribal%20Shellfish%20Framework.pdf](http://yosemite.epa.gov/r10/CLEANUP.NSF/7780249be8f251538825650f0070bd8b/e12918970debc8e488256da6005c428c/$FILE/Tribal%20Shellfish%20Framework.pdf). Although this body weight is consistent with two tribal surveys, it isn't consistent with or reflective of all of the regional contemporary tribal consumption surveys, particularly the older surveys like the CRITFC survey. We believe all of the tribal surveys should be considered when assigning the appropriate body weight for the target population of tribal subsistence fishers. When all surveys are considered, in addition with other data below, the relatively lower 70 kilogram (154 pounds) body weight is more appropriate.

In EPA's 2011 *Exposure Factors Handbook*, the default body weight assumption for human health criteria was updated to 80 kilograms based on National Health and Nutrition Examination Survey (NHANES) data from 1999 to 2006. *Exposure Factors Handbook: 2011 Edition*, National Center for Environmental Assessment, Washington, DC; EPA/600/R-09/052F, 2001, available from the National Technical Information Service, Springfield, VA, and online at <http://www.epa.gov/ncea/efh>. This body weight represents the average US adult body weight, but this isn't appropriate here because the average US population isn't the target population to

protect. The 2000 *Methodology* explains, “In general, exposure factor values specific to *adults* (*emphasis added*) and relevant to lifetime exposures are the most appropriate values to consider when determining criteria to protect against effects from *long-term exposure* (*emphasis added*) which, by and large, the human health criteria are derived to protect. 2000 *Methodology* at p.3-17.

The 80 kilogram body weight is not representative of the higher fish consuming Pacific Islander populations who, based on King County survey data, have lower average body weights. Thus, usage of an 80 kilogram body weight in the derivation of a human health standard would be under protective for this population as well. For these reasons, the Puyallup Tribe recommends a body weight of 70 kilograms in the derivation of state human health criteria.

CHILDREN

In its draft rule, Ecology fails to recognize risks to children. The risks posed to children from toxics are substantial within the Puyallup Tribe. Most of the Tribe’s families remain on or near the Puyallup Reservation, now heavily urbanized long after the WWII machinery and apparatus has left and been replaced by port, industrial, commercial and municipal infrastructure and development. It is recognized as the most urbanized Reservation in the United States. The demographics of the Tribe have recently shifted in recent generations with a higher proportionality of children who, unlike almost all other populations, stay on or near the Reservation and will be exposed to a myriad of increased toxics not only because they eat much more fish than the average Washingtonian, but also because they have additional exposure routes (i.e. inhalation via sweats) that may adversely impact their health.

To protect their most vulnerable, the Puyallup Tribe recommends the state use a body weight of 30 kg in a variety of circumstances to provide additional protection for children when the chemical of concern indicates health effects in children are of primary concern. EPA recommends this approach in the 2000 *Methodology*. 2000 *Methodology*, at 4-29. The exposure factor values provided in the 2000 *Methodology* for women of childbearing age and children should be used in these situations and the state rule language should reflect this recommendation to provide certainty for the protection of women and children throughout our state.

For short-term exposures to toxics that pose a risk of developmental effects to children, EPA recommends the following:

Short-term exposure may include multiple intermittent or continuous exposures occurring over a week or so. Exposure factor values relevant for considering chronic toxicity, as well as exposure factor values relevant for short-term exposure developmental concerns, that could result in adverse health effects (should be considered)... EPA may consider developing criteria for developmental health effects based on exposure factor values specific to children or to women of childbearing age. EPA encourages States and Tribes to do the same when health risks are associated with short-term exposures. *2000 Methodology* at pp.4-17 – 4-18.

In addition to the EPA guidance above, Washington should also be using the 30kg standard as a result of the need to protect Tribal Treaty Rights throughout waters in Washington State. Washington must develop criteria in order to protect the target population of higher fish consumers and the most vulnerable or sensitive populations to meet its obligations under the Clean Water Act and Tribal Treaty Rights.

Drinking Water Intake

We agree with updating the drinking water intake rate to 2.4 liters per day, based on national survey data. This is consistent with EPA's proposed federal rules (September 2015) and EPA's 2015 Nationally Recommended Water Quality Criteria.

Bioaccumulation/Bioconcentration Factor (BAF/BCF)

Ecology has chosen to utilize bioconcentration factors (BCF) in the state's proposed human health criteria, which were used in the derivation of the National Toxics Rule criteria almost 15 years ago. Ecology's justification for the use of BCF is bizarrely based on a "risk management decision" that is wholly unsupported and contrary to EPA's 2000 Methodology and EPA's most recent (2015) Nationally Recommended Criteria. Ecology replaces the requirements to use the best available science and the overall hierarchy which calls for use of the most recent EPA data absent specific local data with a "policy decision" to utilize outdated national standards. *Id.* and *2000 Methodology*. Ecology's decision to utilize BCF is arbitrary and capricious.

Contrary to Ecology's arbitrary and capricious decision in the Proposed Rule, the Puyallup Tribe recommends the use of bioaccumulation factors in the derivation of the state's human health criteria to be more protective of human health consistent with EPA's updated 2015

nationally recommended criteria, EPA's draft Federal Water Quality Standards Rule (September 2015), and EPA's *2000 Methodology*. This methodology represents the newest and best science from the agency given the duty by Congress to establish national recommendations of water quality standards. This approach accounts for variation in bioaccumulation of pollutants based on trophic position of the organism. The draft Federal Rule accounts for trophic level 4 exposure, while the 2015 Nationally Recommended Criteria account for three trophic levels of fish. We agree with EPA's use of trophic level 4 BAF from the draft Federal Rule in conjunction with at least 175 grams per day FCR, because the surveyed population of which the FCR is based, consumed almost exclusively trophic level 4 fish (i.e. predator fish species). This is an important and significant leap in quantitatively and thus precisely accounting for more exposure pathways than direct contact accounts for and therefore will be more accurate in representing exposures to pollutants that affect human health. EPA's methodology for deriving human health criteria emphasizes using measured or estimated bioaccumulation factors, which account for chemical accumulation in aquatic organisms from all potential exposure routes. *National Recommended Ambient Water Quality Criteria for the Protection of Aquatic Life and Human Health*, Environmental Protection Agency, available at: <http://www.epa.gov/waterscience/criteria/wqctable/index.html>. Unlike bioconcentration, BAFs account for more exposure pathways than direct water contact.

The difference between bioconcentration and bioaccumulation and the consequence of this significant advancement in the science of toxicology, is discussed in the 2000 Human Methodology document:

... the term "bioaccumulation" refers to the uptake and retention of a chemical by an aquatic organism from all surrounding media (e.g., water, food, sediment). The term "bioconcentration" refers to the uptake and retention of a chemical by an aquatic organism from water only. For some chemicals (particularly those that are highly persistent and hydrophobic), the magnitude of bioaccumulation by aquatic organisms can be substantially greater than the magnitude of bioconcentration. Thus, an assessment of bioconcentration *alone would underestimate the extent of accumulation in aquatic biota for these chemicals* [for emphasis]. *2000 Methodology* at p.5-2.

According to EPA's assessment above, Ecology's risk management "policy decision" fails to account for chemical accumulation and biomagnifications as a result of multiple pathways, leading to a failure to protect designated uses by failing to accurately

assess consumption of chemicals through consumption of fish. Ecology's Proposed Rule is arbitrary, capricious, contrary to law, and violates Tribal Treaty Rights.

Fish Consumption Rate (FCR)

As discussed above, Washington has a duty under the Clean Water Act to protect designated uses including fishing, and in conjunction with the Tribe's treaty right to harvest fish and shellfish, to protect Tribal members' right to safely consume those fish which they harvest under that treaty right. This necessitates, as EPA guidance has also determined, that Washington use local data to determine the appropriate level of fish protections to protect Tribal members.

It is well settled that the current fish consumption rate of 6.5 g/day is far below the actual amount of fish consumed per day per individual in Washington. EPA guidance is clear: local fish consumption data should be used over the outdated National Toxic rule for human health water quality standards. *2000 Methodology* at 1-12 and 4-25. EPA has warned Washington that its fish consumption rate is woefully inadequate. *Letter to Maia Bellon, Director of the Department of Ecology from Dennis McLerran, Region 10 EPA Administrator* dated April 8, 2014. Multiple surveys across the state that have been provided and reviewed by Ecology indicate fish consumption numbers as high as 796.9 g/day and suggest that historic consumption rates are in excess of 1000 g/day for adults. *Fish Consumption Rates. Technical Support Document. A Review of Data and Information about Fish Consumption in Washington. Version 2.0 Final.* Washington Department of Ecology, Publication No. 12-09-058, January 2013 at Attachment C: Statistical Analysis of National and Washington State Fish Consumption Data by Nyak Polissar et al, available at: <https://fortress.wa.gov/ecy/publications/publications/1209058.pdf> ("Fish Consumption Technical Support Document").

The simple fact is that the 175 g/day fish consumption rate was a negotiated rate reached after long discussions between Ecology and tribes in Washington. It was always clear that the tribes only meant for the 175 g/day to be an incremental step for this triennial review and was based upon a cancer risk rate of 10^{-6} . In fact, the fish consumption rate should be much higher to adequately protect the tribal subsistence right to take fish in their Usual and Accustomed fishing grounds. These rates as well as unsuppressed contemporary rates have been documented in Harper and Walker (2015).

Furthermore, the 175 grams per day FCR is the negotiated value used in Oregon's updated human health criteria, which is based on the 90-95th percentile of Oregon fish consuming populations. This rate is in between 225 grams per day (mean of the Suquamish

Tribe's survey) and 125 grams per day (mean of the means of the Suquamish, Tulalip and Squaxin Tribal FCR surveys), which are the other alternative FCRs the State considered in their public forum process while developing the draft water quality standards rule. *Handout RE: Rulemaking General Information*, Washington State Department of Ecology, 2014, Public meeting held on November 6, 2014, at 27. However, none of these values approximate the 95th percentile range of these tribal fish consumption studies. The mean of these studies at the 95th percentile range is about 448 grams per day. This value includes all fish (finfish, shellfish, and non-anadromous fish). *Fish Consumption Technical Support Document*. Still, these values don't come close to the historic, unsuppressed FCRs of the northwest's tribes, which are about 800-1000 grams per day. *Id.* On par with these rates, EPA recently approved the Spokane Tribe's historic fish consumption rate of rate of 865 grams per day. *Letter to Chairman Rudy Peone from Daniel D. Opalski, Director, Office of Water and Watersheds RE: EPA's Action on the Spokane Tribe of Indian's 2010 Revisions to their Surface Water Quality Standards*, dated December 19, 2013, available at http://www.epa.gov/region10/pdf/water/wqs/spokane_cover_letter_TSD_Dec192013.pdf. Ecology's use of 175 g/day is arbitrary and capricious, and a violation of law.

It is also important to note that using 175 g/day for the fish consumption rate is a single variable in a long multi-variable equation used to derive water quality standards. The FCR of at least 175 g/day must not only be coupled with a cancer risk rate of 10^{-6} , but the other inputs into the derivation of the criteria must also be sufficiently protective and justified using a sound scientific rationale. The Puyallup Tribe agrees with the state's decision to explicitly account for salmon in the FCR for the development of the draft human health criteria. This decision is consistent with the 2000 Methodology's four preference hierarchy to use local data and/or data reflecting similar populations groups before considering the use of data from national surveys or EPA default rates. *2000 Methodology*.

EPA has historically used a FCR that includes the intake of freshwater and estuarine species only, as salmon is excluded in the rate because of its marine life history. Conversely, the state made the appropriate determination to base the FCR on highly exposed populations, as strongly recommended in the EPA 2000 Methodology. The state supports its determination saying: "Since Washington has a strong tradition of fish and shellfish harvest and consumption from local waters, and with-in state survey information indicates that different groups of people harvest fish both recreationally and for subsistence, Ecology has made the risk management decision to base the fish consumption rate used in the HHC equation on "highly exposed populations...." *Rule Overview* at 16. The state further concludes that the FCR should include

“all fish and shellfish,” including all salmon, restaurant, locally caught, imported, and from other sources” for highly exposed populations including tribes “that consume both fish and shellfish from Puget Sound waters”. *Id.* at 17.

Therefore, for the *purposes of this triennial review*, the Puyallup Tribe recommends a fish consumption rate of *at least* 175 grams per day¹, with a commitment in forthcoming triennial reviews, to review and adjust the fish consumption rate sufficiently to: 1) protect all tribal members throughout the State of Washington, including the subsistence use; and 2) fully protect treaty rights in tribal usual and accustomed fishing areas to fully exercise the right to take fish in the quantities entitled to them explicitly under the Boldt decision *U.S. v. Washington*, 384 F.Supp. 312, (W.D. Wash., 1974). The full protection of the treaty right to take fish necessitates derivation of a consumption rate that is not suppressed because of concerns about consuming fish and shellfish in Usual and Accustomed fishing and shellfish beds contaminated with toxic pollutants.

Relative Source Contribution (RSC)

Ecology proposes to retain an RSC of 1 in its Proposed Rule. Ecology discounts EPA’s guidance that states in order to appropriately analyze the risk and protect health states must consider RSC values of .2-.8 to account for exposures other than drinking water and consuming fish to be sure those exposures from drinking water and consuming fish do not lead to an overall exceedance of a safe exposure. *Id.* and *2000 Methodology* at 1-7. In 2015, upon evaluation of chemical uses, properties, releases to the environment, EPA developed chemical specific RSCs for non-carcinogens and non-linear carcinogens ranging from 0.2 to 0.8 following the exposure Decision Tree approach described in the *2000 Methodology*. The Tribe recommends using the same RSCs to derive human health criteria for Washington. Where EPA did not update specific pollutants in the 2015 nationally recommended criteria, the Tribe recommends using an RSC of 0.2 to derive criteria for these pollutants, to ensure adequate human health protections.

The purpose of the RSC is to ensure that the level of a chemical allowed by a criterion will not result in exposures that exceed the reference or safe dose of a toxic substance. Human health water quality criteria address exposure only through drinking water and eating fish. The RSC identifies or estimates the portion of a person’s total exposure attributed to water and fish consumption and thereby accounts for potential exposure of toxics from other sources such as

¹ The recommendation of 175 g/day is also based upon a cancer risk rate of 10⁻⁶.

skin absorption, inhalation from ceremonial uses and sweats in sweat lodges, other foods, and occupational exposures. All of these exposure pathways must be accounted for in order for a water quality criteria to be protective. Setting a relative source contribution of 1 means that only contaminant sources from water and fish and shellfish are accounted for in the derivation of the criterion, discounting all other exposure pathways. To be sufficiently protective of human health, contaminants from all sources must be accounted for and apportioned in the derivation of a water quality criterion. Such an approach is arbitrary and capricious and has no sound scientific or defensible basis. The state's argument that only those sources that can be controlled under the Clean Water Act (i.e. water and fish and shellfish) should be used in the derivation of the relative source contribution and thus the criterion is irrelevant. The derivation of the standard is based on protection of human health, not what pollutants can or can't be controlled under the authorities of the Clean Water Act.

EPA published final updated ambient water quality criteria for the protection of human health for 94 chemical pollutants. These updated recommendations reflect the latest scientific information and EPA policies, including updated body weight, drinking water consumption rate, fish consumption rate, bioaccumulation factors, health toxicity values, and relative source contributions.

Relative Source Contribution for Methylmercury

EPA found that the most significant source of exposure to methylmercury was the ingestion of marine fish. *Mercury Source Assessment*, United Nations Environment Program, Inter-organization Program for the Sound Management of Chemicals, Geneva, Switzerland, 2013, available at <http://www.chem.unep.ch/mercury/Report/Chapter4.htm>. Thus, the RSC of 2.7×10^{-5} mg methylmercury/kg/day is recommended by EPA as an estimated exposure from marine fish intake. EPA's recommendation is based on the assumption that the fish consumption rate does not include fish of marine origin. However, as part of the re-evaluation of local and regional data and the selection of a fish consumption rate of 175 grams per day, Washington did take into consideration the consumption of salmon and regional consumption rates that included estuarine finfish and shellfish. Therefore, in reviewing this information, it is not necessary to provide additional protection from ingestion of marine fish through the use of an RSC value. As a result, the exposure related to marine fish should be subtracted out, resulting in an RSC of zero. Ecology has failed to address this issue in the Proposed Rule.

Relative Source Contribution for Endrin

PTI agrees with the Oregon DEQ rationale for Endrin that routes of exposure other than drinking water and fish tissue are unlikely in Washington State as endrin was banned in the US in 1980s, USFDA declared in 1995 that exposure to endrin from foods was no longer a concern, and it is not mobile in soil and volatilizes rapidly in air. Thus, 80% is recommended. Where it can be demonstrated that other sources and routes of exposure are not anticipated for the chemical in question, EPA recommends a ceiling of 80%. *2000 Methodology*. Ecology has failed to address this issue in its proposed rule.

Ecology has failed to provide scientific justification for deviating from EPA's scientifically supported use of RSC values of .2-.8. Ecology attempts to couch their reasoning as a well thought out state policy, directly contradicting EPA guidance. Ecology's determination to utilize a RSC of 1 is arbitrary, capricious, contrary to law, and violates Tribal Treaty Rights.

Deriving the Human Health Criteria for Carcinogens

The *2000 Methodology* describes the procedures that can be used as guidance by states for deriving human health water criteria. The *2000 Methodology* includes an equation to be used in deriving the "water + organism" and "organism only" human health criteria for carcinogens to protect the fishing and drinking water uses. A simplified version of this equation is provided below.

The simplified equation for deriving the human health criteria for carcinogens is:

$$AWQC = \frac{\text{Risk Level} \cdot BW}{[CSF \cdot (DI \cdot (FCR \cdot BAF))]}$$

AWQC = Ambient Water Quality Criterion (milligrams per liter)

Risk Level = Risk level (unitless)

CSF = Cancer slope factor (milligrams per kilogram per day)

BW = Human body weight (kilograms)

DI = Drinking water intake (liters per day)

FCF = Fish Consumption Rate (kilograms per day)

BAF = Bioaccumulation factor (liters per kilogram)

Body Weight, Drinking Water Intake rate, Bioaccumulation/ Bioconcentration and Fish Consumption Rate

The Puyallup Tribe recommends the same input values for body weight, drinking water intake, bioaccumulation/bioconcentration, and fish consumption rate for carcinogens as those already discussed previously for non-carcinogens. See the discussion above for these quantitative assumptions. Consistent with the criteria for non-carcinogens, a fish consumption rate *at least* 175 grams per day is also recommended as discussed above. Use of a body weight of 30 kg when chemicals are of particular concern in children, and a drinking water intake of three liters per day are recommended based on the most up to date science, as described above. Additionally, the Puyallup Tribe also recommends use of bioaccumulation factors consistent with the 2015 Nationally Recommended Criteria with those used by EPA in deriving its national CWA § 304(a) human health criteria guidance values.

Cancer Slope Factor

In deriving human health criteria for carcinogens, the Puyallup Tribe recommends using the cancer slope factors recommended by EPA in the 2015 Nationally Recommended Criteria. EPA has updated the health risk factors, including the cancer slope factor and reference doses, using the most current toxicity information. EPA's Integrated Risk Information System (IRIS) is the primary recommended source for reference dose and cancer slope factor information. For some pollutants, more recent assessments may be found using other resources provided by EPA's Office of Water and other programs.

A cancer slope factor expresses incremental, lifetime risk of cancer as a function of the rate of intake of the contaminant, and is combined with exposure assumptions to express that risk in terms of an ambient water concentration. Cancer slope factors are specific to individual pollutants.

For toxic pollutants identified as carcinogens and assumed to exhibit a linear dose-response relationship at low doses, EPA derives its national CWA § 304(a) human health criteria recommendations to correspond to incremental lifetime cancer risk levels, applying a risk management decision that ensures a reasonable level of protection for the target population. A cancer slope factor is included in the calculation.

The Puyallup Tribe discusses its recommendations for arsenic in a separate section, below.

Carcinogenic Risk Level

Ecology has reconsidered their earlier 2015 draft proposal of lowering the cancer risk level from one excess cancer in a million (1×10^{-6}) to one excess cancer in one hundred thousand (1×10^{-5}). We agree with Ecology's revised cancer risk of one excess cancer risk in a million (1×10^{-6}). This is the "near zero", acceptable risk rate recommend by EPA and the risk rate currently in the state's NTR rule. The Puyallup Tribe agrees with the State of Washington retaining the existing excess cancer risk level of one excess cancer in a million (1×10^{-6}) that is in the state's water quality standards and has been since 1992.

The Puyallup Tribe is a signatory of the Medicine Creek Treaty, 10 Stat. 1132 (1855). The state is party to the treaty and has an obligation to not foreclose the ability of the Tribe to fully exercise the full extent of the treaty right. The exercise of this right is to take fish and safely consume fish throughout the Tribes Usual and Accustomed fishing areas for subsistence, ceremonial, and commercial purposes. The courts have defined the extent of these rights to include a 50% allocation of the fishery as necessary to prevent the Tribes a moderate standard of living *U.S. v. Washington*, 384 F.Supp. 312, (W.D. Wash., 1974). Because treaties are binding and the supreme law of the land, the state in the rulemaking process and EPA who will review and approve or disapprove these rules must not interfere with the full exercise of this right by both protecting the beneficiaries of the right (the consumers to safely consume fish) as well as the safety of the food source (the fishery) to ensure continued reliance to feed their families and secure a moderate living. *See Maine Decision*.

The Tribes' usual and accustomed fishing grounds throughout Washington State compromise a majority of the waters of the state and it is the duty of the state under the Clean Water Act to protect designated uses of these waters which include the fishing use. EPA determined in the recent Maine disapproval action that "to protect the function of these waters to preserve the Tribe's unique culture and to provide for the safe exercise of their sustenance practices, EPA must interpret the fishing use to include sustenance fishing." *Maine Decision* at 26. EPA determined it was their duty to include the concept of sustenance fishing as provided for in the tribal settlement acts, as to do otherwise "would run the risk that state WQS could be based on assumptions about fish consumption rates that could lead to criteria that fail to protect the Tribe's ability to safely consume fish for their sustenance". *Id.* at 32. Accordingly, EPA concluded that the State of Maine had a duty to protect the sustenance use. "To adequately protect the sustenance fishing use, EPA reasoned, the State of Maine was required to revisit two

aspects of its technical analysis supporting the human health criteria that determine how clean waters must be to allow the Tribes to safely consume fish for their sustenance.” *Id.*

EPA continued that the State of Maine’s analysis must treat the tribal population exercising the sustenance fishing use as the target general population, not as a high consuming subpopulation of the State. *Id.* EPA guidance calls for WQS that provide a high level of protection for the general population, while recognizing that small subpopulations may face greater levels of risk. However, the Tribes are not a subpopulation using the waters on their own lands; they are the population for which that land base was established and set aside. Second, the data used to determine the fish consumption rate for tribal sustenance consumers must reasonably represent tribal consumers taking fish from tribal waters and fishing practices unsuppressed by concerns about the safety of the fish available to them to consume. The data on which the State relied to develop the fish consumption rates for the Maine water quality standards did not include information about the sustenance practices of tribal members fishing in their own water, nor did they represent consumption levels that were unsuppressed by concerns about pollution. EPA concluded that the best available data that represent the unsuppressed fishing practices of tribal members fishing in tribal waters are contained in the Wabanaki Lifeways study, which looked at the historic sustenance practices of the Tribes in Maine.” *Id.* at 39. Based on the Maine decision, Tribes in the State of Washington should be viewed by the State as *the target population for making risk management decisions, not a highly exposed subpopulation* as most the waters for which this rule applies throughout the state are Usual and Accustomed fishing grounds. The State of Washington, like in Maine, has a duty to protect the sustenance use in these waters so that tribal members can safely consume fish.

Furthermore, EPA considers 10^{-6} is an appropriate risk level for the target population, which in this case are the Tribes of Washington. *2000 Methodology*, at 2-1. The 10^{-6} cancer risk level is an agency wide practice throughout EPA’s programs as well. Although the FCR of 175 grams per day does not represent a historic, unsuppressed rate, it can only be considered a reasonable value based on the Washington tribal consumptions surveys which necessarily must be *in conjunction with* the 10^{-6} cancer risk level in order to be sufficiently protective for all tribes of the State of Washington to consume fish safely.²

² Again, the FCR of 175 g/day is a rate intended to be re-evaluated at the next triennial review by incorporating additional consumption data to reach an accurate historic consumption rate.

As we addressed in our letter of April 9, 2014 to Governor Inslee, while state managers often equate both cancer risk levels under consideration of 10^{-6} and 10^{-5} as *de minimus* or close to zero, and by extension equivalent in terms of effect, this simply is inaccurate. Only the excess cancer lifetime risk of 10^{-6} , currently used in the state water quality standards, is considered as the “safe dose” that is “negligible” in effect (“essentially zero”). This is considered “acceptable risk” – we agree. This is the basis of why it is this cancer risk level that is used in EPA’s nationally recommended criteria. With both a significantly high cancer incidence rate in our own Tribal members and the highest cancer incidence in the west, changing the cancer risk rate to a less protective level would be reckless and certainly not in the interest of the Puyallup Tribe or Washington State. We expect the state to make risk management decisions to protect the designated uses of the waters of the state as required under the Clean Water Act, and the State must do so in ways that prevent increased risk of harm to all of us, but especially to those who eat significantly more fish. This must include consideration of those at increased risk such as children and elders. Retaining the cancer risk rate of 10^{-6} is not only the correct technical and legal conclusion, it is also the right decision since one in every two men and one in every three women can expect cancer in their lifetimes.

Washington State’s Problem Chemicals – Arsenic, Mercury, and PCBs

Section 304(a)(1) of the Clean Water Act (CWA) requires EPA to develop, publish, and, from time to time, revise criteria for protection of water quality and human health that accurately reflect the latest scientific knowledge. Water quality criteria developed under section 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Unlike the Safe Drinking Water Act maximum contaminant levels (MCLs), Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting pollutant concentrations in ambient water. *Nationally recommended Water Quality Criteria: 2002*, U.S. EPA Office of Water, Washington, D.C. EPA-822-R-02-047, November 2002.

In its 2015 update, EPA revised 94 of the existing human health criteria to reflect the latest scientific information, including updated exposure factors (body weight, drinking water intake, fish consumption rate), bioaccumulation factors, and toxicity factors (reference dose, cancer slope factor). *Fact Sheet: Human Health Ambient Water Quality Criteria: Draft 2015 Update*. U.S. EPA, Office of Water, Washington D.C.; EPA-820-F-15-001, 2015, available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/upload/Human-Health-Ambient-Water-Quality-Criteria-Draft-2015-Update-Factsheet.pdf>. The criteria have also been

updated to follow the current EPA methodology for deriving human health criteria. *2000 Methodology*.

Arsenic

The existing state standard for arsenic under the NTR was established at 0.14 ppb (marine water) in 1992 using the hazard assessment in EPA's Integrated Risk Information System (IRIS) database (U.S. EPA, 1998) according to the 1980 methodology for developing ambient water quality criteria for human health. The criterion for water and fish consumption (freshwater) is 0.018 ppb. These arsenic water quality criteria represent a one in one million (10⁻⁶) cancer risk level for arsenic exposures, and apply as inorganic arsenic only. Ecology is now proposing a Safe Drinking Water Act standard (MCL) of 10 parts per million.

The State offers no scientific rationale on the subject of their use of the Safe Drinking Water Act maximum contaminant level (MCL) for the proposed arsenic criterion, other than to say there is state precedent. Ecology also cites naturally high backgrounds of arsenic in the Western states somehow justifies significantly adjusting the standard to be less protective than the existing standard. We find this argument to be a red herring in that re-stating the condition of state waters is irrelevant for the purposes of deriving a human health standard. The question about natural background is one of implementation, not for setting standards.

The Safe Drinking Water Act MCL is not protective of the designated uses of the State of Washington's waters, namely for "water + organisms" (or those waters designated for drinking water and fishing uses). The Safe Drinking Water standard is a technology standard and is not a human health based standard. Drinking water standards are based on technological and cost considerations that have nothing to do with section 304(a)(1) criteria. Under the Clean Water Act, the state is required to protect designated uses. Use of a SDWA criterion of 10 ppb does not protect the ingestion of water + organism, or tribes whose main route of exposure of arsenic is via ingestion of fish and shellfish. For most of the population, uptake of arsenic through food is the major source of exposure. Among foods, the highest concentrations of arsenic are generally found in fish and shellfish, existing primarily as organic compounds.

EPA's Draft Federal Water Quality Rule published in the FR in September of 2015 recalculates the standard to incorporate a cancer slope factor of 1.75 and a bioconcentration factor of 44, resulting in a standard for water and organisms (freshwater) of 0.0045 ppb and a standard for organisms only of .0059 parts per billion (marine waters). The EPA risk assessments for ambient arsenic human health criteria were based on the epidemiology study in Taiwan by

Tseng et al. (1968) and Tseng (1977) for the prevalence of skin cancer. EPA used the evidence of skin cancer reported in the Taiwan study as the basis for the arsenic hazard and dose response assessment. Using a time- and dose- dependent multistage model which assumes that any exposure to a compound such as arsenic could result in a cancer response, the cancer potency (q1*) estimated for ingested arsenic is 1.75 mg/kg/day. The carcinogenic potency estimate or the slope factor represents the upper bound cancer-causing potential resulting from lifetime exposure to a substance, arsenic in this case.

As the agency with expertise in developing water quality standards using best available science, we agree with and recommend EPA's draft arsenic WQC as published in EPA's Draft Water Quality Standards Federal Rule (September 14, 2015) and recommend it be incorporated into the State's Rule. EPA's draft WQC is more protective of human health, about 500-2000 times more stringent than the state's proposed standard for arsenic. We agree with and recommend this approach because arsenic is designated by EPA as a human carcinogen and there are several known dischargers of arsenic for which there are little to no controls in place to reduce and remove loadings in the Puyallup River watershed. And there could be, but for adequate controls that could be imposed by the state.

The proposed loosening of the state standard is particularly alarming in light of the fact that the former Asarco smelter's arsenic-laden slag was used for ballast on much of the land base in the Tacoma tideflats, including the Puyallup Reservation lands. We know, too, that groundwater in the vicinity of the former smelter has been adversely impacted. Thus, our tribal members have additional routes of exposure (i.e. dermal, inhalation) and as a result, are at increased risk. At this time, amendments should be based on the sound science and only those that have the current best available science in place be included in any updates incorporated into the state rule.

Additionally, the state notes the AKART (i.e. pollution minimization plan) requirement to be applied in addition to the criterion. Yet AKART requirements are already required under state law so such a requirement does not provide any additional protections to human health. Based on low level arsenic monitoring in the watershed, background concentrations are at about 1 ppb. In addition to arsenic-laden slag ballast pervading upland areas on and adjacent to the Tribe's Reservation, there are many known polluters of arsenic in the Puyallup River watershed. Setting a protective level could include the implementation of pollutant minimization plans in order to capture the *controllable fraction* currently discharged to the Tribe's U&A fishing grounds.

Based on our 20+ years of implementation in the Puyallup watershed, we have found that even Oregon's WQS of 2.1 parts per million would mask many anthropogenic inputs we have detected through discharge monitoring. Through the Puyallup Tribe's direct experience with regulating arsenic, the Tribe has found cost-effective remedies such as product substitutions lead to significant improvements in water quality. Arsenic is discharged by POTWs, yet few have effluent limits for arsenic. Surprisingly, arsenic is also in a variety of compounds such as scalers, which control biological growth, and other products that don't include the word "arsenic" on the label. To address this, pollutant minimization plans including interim, enforceable benchmarks and timelines should be included in discharge permits and monitoring should be required in permits.

Ecology's decision on its treatment of arsenic is not protective of tribes nor is it based upon sound science, and relies on an incorrect interpretation of the SDWA and CWA. As such, it is arbitrary, capricious, contrary to law, and violates Tribal treaty rights.

Methylmercury

Ecology has chosen not to update the criteria on Methylmercury, unbelievably ignoring the fact that EPA, in its proposed Federal Rule (September 2015), already made a determination that Ecology's existing standards under the NTR are not protective of designated uses and therefore are not compliant with the CWA. Considerable new data has been provided since the State's last update, and been adopted by EPA. Yet Ecology has chosen not to utilize the best available data, without any sound scientific rationale.

In January 2001, EPA published a new recommended CWA section 304(a) water quality criterion for methylmercury based on fish tissue residues. Water Quality Criterion for the Protection of Human Health: Methylmercury. U.S. EPA, Office of Science and Technology, Office of Water, Washington D.C. EPA-823-R-01-001, January 1, 2001, available at http://water.epa.gov/scitech/swguidance/standards/criteria/health/upload/2009_01_15_criteria_methylmercury_mercury-criterion.pdf. This new criterion replaced the prior total mercury recommended criteria. Prior to 2001, the U.S. Environmental Protection Agency (EPA) recommended that states adopt mercury HHC as "total mercury" measured in surface waters. The updated, 2001 recommended water quality criterion [0.3 milligram (mg) methylmercury per kilogram (kg) fish tissue wet weight], is a limit for the concentration of methylmercury in freshwater and estuarine fish and shellfish tissue that EPA recommends not be exceeded in order to protect consumers of fish and shellfish. However, the EPA 2001 recommended national

criterion (0.3 mg/kg) was calculated using a fish consumption rate of 17.5 g fish/day of freshwater and estuarine fish. *Id.*

The exposure pathway for methylmercury is consumption of contaminated fish. Dietary methylmercury is almost completely absorbed into the blood and is distributed to all tissues including the brain; it also readily passes through the placenta to the fetus and fetal brain. *Id.* at p. ix.

Sources of mercury include atmospheric deposition, erosion, urban discharges, agricultural materials, mining, combustion, and industrial discharges. *Sources and remediation for mercury contamination in aquatic systems – a literature review*, Wang, Q., D. Kim, D.D. Dionysiou, G.A. Sorial, and D. Timberlake, *Environmental Pollution* 131: 323-336 (2004). Methylmercury is the most important form of mercury toxicologically, because it can be readily taken up across lipid membrane surfaces. Methylmercury can also be bioconcentrated in fish tissues over a thousand times from water concentrations as low or lower than 1 micrograms per liter (µg/L). *Mercury: its occurrence and effects in the ecosystem*, Peakall, D.B. and R. J. Lovett, *Bioscience* 22: 20-25 (1972). Exposure to methyl mercury is usually through ingestion of fish and shellfish. The CRITFC survey revealed that methyl-mercury exposure risks to tribal women (consuming at the CRITFC average rate of 389 grams/day) compared to women in the general population (consuming at EPA's default rate of 17.5 grams/day) are shocking, evidencing that women consuming at the tribal consumption rate are exposed to methyl-mercury at levels nine to thirteen times the EPA's reference (safe) dose. Based on these facts, it is clear that the criterion should be updated to include the tissue-based limit in the 2001 EPA recommendations *and* include the revised FCR of 175 grams per day.

The state's reasoning for not updating the methylmercury criteria because of the absence of an implementation plan has no merit, is without sound scientific rationale and, therefore, arbitrary and capricious. Furthermore, the Proposed Rule is contrary to law and violates Tribal treaty rights regarding its failure to update the methylmercury criteria. The development of criteria is distinct from how the criteria get implemented under Sections 401 and 402 and other implementing regulations of the CWA. The problems that come from regulating methylmercury due to implementation issues are distinct from development of criteria. Ecology can address the difficulties through use of the April, 2010 EPA guidance for implementing the methylmercury criteria and work via a public process on closing data gaps, including questions regarding mixing zones, variances, and other provisions.

PCBs

Washington's cancer-based human health criteria for PCBs are based on revisions to the 1992 outdated NTR and adjustments to the cancer risk level. The State calculates the cancer risk rate at 4 per 100,000 rather than meeting the EPA standard of one-in-one-million. The State justifies its decision as a chemical specific risk management decision. EPA revised the 1992 NTR criteria to incorporate new science on the cancer potency factor based on the toxicity of PCB mixtures and different exposure pathways in 1999. This criterion is the one currently in Washington's rule and is 0.00017 ug/L for the protection of human health from consumption of aquatic organisms in marine and estuarine waters and 0.00017 ug/L for protection of human health from consumption of drinking water and organisms in most freshwaters. *Rule Overview.* In fact, in this regard Ecology utilized its policy for this rulemaking that no criteria should be less stringent than the criteria currently in place, which has been in place since 1992. In this case, Ecology had to go to this anti-backsliding default due to all the other criteria they wrongfully weakened (as discussed herein) after running the calculations with the other elements of the equation used to derive the criterion.

PCBs are ubiquitous, bioaccumulative carcinogens that are the culprit of many fish advisories throughout the State of Washington and impaired waters. PCBs are widespread in the environment, but have been decreasing since the 1979 ban was effectuated. *Rule Overview.*

PCBs are known endocrine disruptors and have been shown to cause cancer in animals. Research studies show "conclusive evidence that PCBs cause cancer" in animals and "the data strongly suggests that PCBs are probable human carcinogens." *Hazardous Waste PCBs Fact Sheet*, U.S. Environmental Protection Agency, 2014, available online at: <http://www.epa.gov/solidwaste/hazard/tsd/pcbs/about.htm>. PCBs concentrate in low trophic level organisms and through the gills of fish that filter large amounts of water. Bioaccumulation of PCBs takes place in predatory organisms as the body burden of prey is transferred to the predator including humans. *Id.* A prerequisite for a substance's strong bioaccumulation factor is an affinity for fat and persistence in the environment. This further highlights that bioaccumulation factors should be utilized when developing criteria for persistent, bioaccumulative, toxic pollutants, as discussed above, and it is critical with high bioaccumulation factors such as PCBs.

Ecology has recommended EPA standard method 608 for PCBs with a quantitation limit of 0.5 µg/L that is more than three orders of magnitude higher than the proposed standard of 0.00017 µg/L. In September 2010, EPA proposed to add EPA Method 1668C "Chlorinated

Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS” to 40 CFR Part 136. EPA’s suggested method is a significant improvement in sensitivity. The reporting limits for congeners in aqueous samples using HRGC/HRMS are 0.0001- 0.0004 µg/L. Washington must recognize that analytical techniques for PCBs have evolved beyond method 608 and the state should require their use as part of a comprehensive effort to limit the release of PCBs into the environment, or at a minimum provide a clear scientific basis for failing to utilize the updated method.

The Puyallup Tribe recommends Washington’s standards should be updated for PCBs using the 10^{-6} cancer risk level and updated bioaccumulation factors in EPA’s draft Federal Rule because PCBs are bioaccumulative carcinogens. Using these inputs, the criterion is about 23 times more protective than the state proposal. Ecology needs to fully consider the health impacts of this bioaccumulative carcinogen and seriously evaluate opportunities for product substitution on the myriad materials that contain PCBs. Ecology’s failure to implement those items above is not based upon science but a policy decision. Absent a sound scientific justification for Ecology’s position on PCB’s the Proposed Rule is arbitrary, capricious, contrary to law, and violates Tribal treaty rights.

2,3,7,8 TCDD (Dioxin)

The State of Washington proposes using the old 1992 NTR value for the dioxin criterion, ignoring more recent advancements on the subject. But for Governor Inslee’s no backsliding provision, the criterion would be even less protective than the NTR. The Tribe recommends using the most recent Nationally Recommended Criteria Recommendation for dioxin which was published in 2002. At this time, we recommend using the same q_1 or cancer slope factor, BCF, and cancer risk level but to update the FCR in the derivation. EPA is currently working on updating the BCF and when the final revised criteria are published by EPA, we recommend the state follow suit. The section 304(a) water quality criteria for dioxin contained in this compilation is expressed in terms of 2,3,7,8-Tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD) and should be used in conjunction with the national/international convention of toxicity equivalence factors (TEF/TEQs) to account for the additive effects of other dioxin-like compounds (dioxins). The Tribe agrees with EPA to use the 1998 WHO TEF scheme because it is based on more recent data and is internationally accepted. (See: *Update to the Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and -dibenzofurans*, EPA/625/3-89/016, March 1989 and Van

den Berg M., 1998). By applying the TEF/TEQ approach, the other highly toxic dioxins will be properly taken into account.

The following facts about dioxin are taken from The Agent Orange Association of Canada <http://www.agentorangecanada.com/dioxin.php> and EPA's Environmental Assessment Unit:

- More than 90% of human exposure is through food, mainly meat and dairy products, fish and shellfish.
- 2,3,7,8 TCDD (Dioxin) is more commonly recognized as the toxic contaminant found in Agent Orange and at Love Canal, NY and Times Beach, Missouri.
- The average levels of dioxin in the U.S. population is about 25 parts per trillion (ppt) according to the US Environmental Protection Agency (EPA). Approximately 10% of the population may have tissue levels as much as 3 times higher than this level.
- Dioxin appears to act like an extremely persistent synthetic hormone, altering important signaling systems in humans and wildlife. This toxic mimicry leads to altered cell development, differentiation, and regulation.
- Dioxins also may result in reproductive and developmental effects in humans at levels already present in the body of the average person. (Based on their consumption of significantly more fish and shellfish, these affects are magnified in tribal people).
- The EPA has found that the body burden level of dioxin in animal studies can be related to adverse health effects observed in both animals and people. They have also found that the average level of dioxin found in the general US population is very close to these levels. EPA interprets this to mean that there is little or no "margin of exposure" left for most people. We see this as meaning that we are nearly "full" and that any additional exposure of dioxin can result in adverse health effects. Some people already have body

burden levels that are above the average and they are likely already suffering adverse health effects.

- Tribal people, nursing infants, and workers who live near dioxin release sources are at greater risk of developing adverse health effects from dioxin because they are exposed to higher concentrations.
- Dioxin's "half-life" in the human body is about seven years. In other words, it takes about seven years for half of the dioxin in your body to be removed and then another seven years for the half of that amount and so on. This means your body will never be free of dioxin contamination.
- As a carcinogen and endocrine receptor, exposure to dioxin can lead to a wide array of adverse health effects including cancer, birth defects, diabetes, learning and developmental delays, endometriosis, and immune system abnormalities.
- Dioxin binds very strongly to intracellular receptors in the nuclei of animal and human cells throughout the body. So dioxin can easily get into the nucleus, where the cell's DNA is located, and wreak havoc. If it damages the DNA, that could cause cancer or birth defects. It could also alter the DNA's instructions to make normal enzymes, hormones, and other proteins, which could lead to any of a number of diseases.
- Dioxin is a known carcinogen. TCDD is the most potent animal carcinogen ever tested. It causes tumors in both genders of every species and every strain of animal that's been tested. And the animals get different types of tumors, so it doesn't just initiate tumors, it also promotes the growth of tumors caused by other chemical initiators.
- In January 2001, the Department of Human Health and Services' National Toxicology Program classified dioxin as a known human carcinogen. The September 2000 draft of the USEPA's Health Assessment document on dioxin also classifies dioxin as a known

human carcinogen. A: It is the most potent substance ever tested by the USEPA or by any private or government research center. Dioxin causes cancer in multiple species in multiple organs in both sexes. Cancer in animals has resulted from exposures as low as 200 ppt.

- The USEPA released a draft report last fall that projected an excess cancer risk of one in 100 for the most sensitive people who consume a diet high in animal fats. In other words, the risk of getting cancer from dioxin - over and above the risk of cancer from other sources - is one in 100 for some people. This is a worst-case scenario. It's for the most sensitive people among the five percent of the population who consume the most dioxin. Scientists refer to this as the "upper bound estimate." This is a shocking estimate and likely tribal members fall into this category based on their high intake of fish and shellfish.. A general "acceptable" risk level is one-in-one-million.
- Dioxin impairs the human reproductive system, birth defects, learning and developmental delays, endometriosis, immune system abnormalities, and diabetes. Tribal nations are disproportionately affected because they eat more fish and shellfish than the average Washington consumer.

Dioxins are produced as a result of combustion processes such as waste incineration (commercial or municipal) or from burning fuels (like wood, coal or oil). Dioxins produced by backyard burning. Dioxins are also produced by bleaching processes (pulp and paper).

Absent a sound scientific justification for Ecology's position on PCB's the Proposed Rule is arbitrary, capricious, contrary to law, and violates Tribal treaty rights.

IMPLEMENTATION TOOLS

Compliance Schedules

According to federal regulations, compliance schedules must require compliance "as soon as possible, but not later than the applicable statutory deadline under the CWA." 40

C.F.R. §122.47(a)(1). Existing Washington State regulations set compliance schedule limits at 10 years. This is consistent with most states' rule provisions and is based on the 5-year NPDES discharge permit durations.

The proposed draft rule language mandates compliance with "water quality standards in the shortest practicable time". *See Proposed Rule.* Instead, Ecology should revise its rule to utilize the federal language in 40 C.F.R. §122.47(a)(1) – "as soon as possible". There is a significant difference between "practicable" and "possible" as the impermissible subjective factors creep in with the use of "practicable" with regard to the regulated community. The Federal Regulations avoided this difficult issue in complying with the Clean Water Act's mandate and using "possible."

Not providing a time certain timeframe for compliance schedules is a significant and unacceptable deviation from existing rule language that provides a time certain deadline for complying with water quality standards. In fact, the draft rule language as written provides an open-ended off ramp from meeting water quality standards in a timely way and delays measurable progress in water quality in the interim. This is contrary to the Clean Water Act. The draft rule language as written misconstrues the intent of compliance schedules in the CWA. Notably, compliance schedules that are longer than one year in duration must set forth interim requirements and dates for their achievement. 40 C.F.R. §122.47(a)(3). Instead of a "schedule for compliance", the Proposed Rule grants polluters a wide berth to pollute and not meet effluent limits necessary to achieve water quality standards.

Even in those circumstances where a TMDL is in place, state statute allows for a compliance schedule to exceed 10 years but the terms for compliance are strictly constructed under the statute:

- (1)The permittee is meeting its requirements under the total maximum daily load as soon as possible;
- (2) The actions proposed in the compliance schedule are sufficient to achieve water quality standards as soon as possible;
- (3) A compliance schedule is appropriate; and
- (4) The permittee is not able to meet its waste load allocation solely by controlling and treating its own effluent. RCW 90.48.605.

The Hanlon Memo precisely defines the requirements of compliance schedules further:

Any compliance schedule contained in an NPDES permit must *include an enforceable final effluent limitation and a date for its achievement* that is within the timeframe allowed by the applicable state or federal law provision authorizing compliance schedules as required by CWA sections 301(b)(1)(C); 502(17); the Administrator's decision in *Star-Kist Caribe, Inc.* 3 E.A.D. 172, 175, 177-178 (1990); and EPA regulations at 40 C.F.R. §§ 122.2, 122.44(d) and 122.44(d)(I)(vii)(A).

Memorandum from James A. Hanlon, Director of the EPA Office of Water to Alexi Strauss, Director of Water Division EPA Region 9, Re: compliance schedules for water quality based effluent limitations in NPDES permits, U.S. EPA, May 10, 2007, available at <http://water.epa.gov/lawsregs/guidance/wetlands/upload/signed-hanlon-memo.pdf> (“Hanlon Memo”).

Although, EPA does not expressly state the limitations of the “timeframe allowed,” everything in the CWA points to the fact that such schedules should be, at a minimum or “as soon as possible”.

Furthermore, the rule language should include enforceable interim numeric limits and narrative limits when the narrative provisions are enforceable, as in the case of facility construction deadlines. This is consistent with the Hanlon Memo. *Hanlon Memo* at 2.

Therefore, based on the law and policy above, the Puyallup Tribe recommends that for non-TMDL Waters, Ecology require the shortest timeframe possible on a case-by-case basis. Ecology must mandate that schedules of compliance may not exceed ten years, and shall generally not exceed the term of any permit. When appropriate and as soon as possible, Ecology should require that the compliance schedule shall lead to compliance with the state water quality standards and the Clean Water Act and implementing regulations. For TMDL waters, Ecology must mandate that compliance schedules may not exceed the 10 year timeline, unless permittees meet the requirements of the four part test established in RCW 90.48.605, as discussed above. If the permittee meets the four part test requirements, compliance schedules must be the shortest timeframe possible, so long as it is not later than the applicable statutory deadline under the Clean Water Act 40 CFR §122.47(a)(1). When

appropriate, and as soon as possible, the compliance schedule shall lead to compliance with the state water quality standards, Clean Water Act and implementing regulations.

The rule language for compliance schedules in both non-TMDL and TMDL waters alike should incorporate as much of the Hanlon Memorandum language or intent as possible. The Hanlon Memo specifically recommends

1. "When appropriate," NPDES permits may include "a schedule of compliance leading to compliance with CWA and regulations ... as soon as possible, but not later than the applicable statutory deadline under the CWA." (40 CFR 122.47(a)(1)). Compliance schedules that are longer than one year in duration must set forth interim requirements and dates for their achievement. (40 CFR 122.47(a)(3)).

2. Any compliance schedule contained in an NPDES permit must be an "enforceable sequence of actions or operations leading to compliance with a [water quality-based] effluent limitation ["WQBEL"]" as required by the definition of "schedule of compliance" in section 502(17) of the CWA. *See also* 40 CFR 122.2 (definition of schedule of compliance).

3. Any compliance schedule contained in an NPDES permit must include an enforceable final effluent limitation and a date for its achievement that is within the timeframe allowed by the applicable state or federal law provision authorizing compliance schedules as required by CWA sections 301(b)(1)(C); 502(17) and EPA regulations at 40 CFR 122.2, 122.44(d) and 122.44(d)(I)(vii)(A).

4. Any compliance schedule that extends past the expiration date of a permit must include the final effluent limitations in the permit in order to ensure enforceability of the compliance schedule as required by CWA section 502(17) and 40 CFR 122.2 (definition of schedule of compliance).

5. In order to grant a compliance schedule in an NPDES permit, the permitting authority has to make a reasonable finding, adequately supported by the administrative record, that the compliance schedule "will lead to compliance with an effluent limitation ... " "to meet water quality standards" by the end of the compliance schedule as required by sections 301(b)(1)(C) and 502(17) of the CWA. *See also* 40 CFR 122.2, 122.44(d)(1)(vii)(A).

6. In order to grant a compliance schedule in an NPDES permit, the permitting authority has to make a reasonable finding, adequately supported by the administrative record and described in the fact sheet (40 CFR 124.8), that a compliance schedule is "appropriate" and that compliance with the final WQBEL is required "as soon as possible." *See* 40 CFR 122.47(a), 122.47(a)(1).

7. In order to grant a compliance schedule in an NPDES permit, the permitting authority has to make a reasonable finding, adequately supported by the administrative record, that the discharger cannot immediately comply with the WQBEL upon the effective date of the permit. 40 CFR 122.47, 122.47(a)(1).

8. Factors relevant to whether a compliance schedule in a specific permit is "appropriate" under 40 CFR 122.47(a) include: how much time the discharger has already had to meet the WQBEL(s) under prior permits; the extent to which the discharger has made good faith efforts to comply with the WQBELs and other requirements in its prior permit(s); whether there is any need for modifications to treatment facilities, operations or measures to meet the WQBELs and if so, how long would it take to implement the modifications to treatment, operations or other measures; or whether the discharger would be expected to use the same treatment facilities, operations or other measures to meet the WQBEL as it would have used to meet the WQBEL in its prior permit.

9. Factors relevant to a conclusion that a particular compliance schedule requires compliance with the WQBEL "as soon as possible," as required by 40 CFR 122.47(a)(1) include: consideration of the steps needed to modify or install treatment facilities, operations or

other measures and the time those steps would take. The permitting authority should not simply presume that a compliance schedule be based on the maximum time period allowed by a State's authorizing provision.

10. A compliance schedule based solely on time needed to develop a Total Maximum Daily Load is not appropriate.

11. A compliance schedule based solely on time needed to develop a Use Attainability Analysis is also not appropriate.

Ecology's Proposed Rule fails to sufficiently limit compliance schedules. Based upon the items discussed above regarding compliance schedules, the Proposed Rule is arbitrary, capricious, contrary to law, and violates Treaty Rights.

Variances

Ecology proposes to provide variances for individual permittee, groups of permittees and even whole water bodies to avoid compliance with water quality standards. Variances may be applied to toxics or conventional parameters like temperature and dissolved oxygen that impact aquatic life. Variances under the state's rule are "time-limited", but so too was the time of the dinosaurs and they lasted over a million years. This "off-ramp" to the Clean Water Act and the new federal water quality regulations is a blatant disregard of the duty of the state to preserve water and aquatic resources for this and future generations under the Public Trust Doctrine. We have worked in good faith with Ecology long enough on the subject of variances to little avail. Time has run out, the Tribe will put the full force of its governmental authorities and duties to ensure variances do not get effectuated in its Treaty Usual & Accustomed fishing grounds. Ecology's proposed provisions for variances are outrageously over-reaching, ambiguous, arbitrary, capricious, and contrary to law and recent federal regulation.

Ecology's proposed rule establishes an explicit regulatory framework for the adoption of WQS variances that the state may use to implement adaptive management approaches to improve water quality. This policy, as a general policy, is discretionary under the Clean Water Act. We find it absolutely unconscionable that the state, using a discretionary policy, proposes to dismantle the protections of standards afforded by the CWA. Though a discretionary policy, the proposed variance provisions are subject to review and approval by EPA for consistency with the new federal water quality regulations published by EPA in August, 2015.

The variance provision is intended to effectuate incremental progress in water quality adaptively, while preventing a permanent downgrade in use. While apparently well intended, it will result in the unintended consequence of little to no improvements in water quality, while providing polluters shields from compliance for undetermined and extended periods of time. There is already a process under Section 303(d) of the CWA that provides for a better process for restoring waters of the state, that doesn't rely on "incremental" progress adaptively, but requires restoration to attain the designated use. And, it's enforceable. The risk, once again, is shifted to the resource and disproportionately on those peoples who consume and rely on the resource for subsistence, ceremonial, and other purposes.

Most importantly, the state's proposed variance policy will prevent the Tribe from fully exercising its treaty rights in its Usual and Accustomed fishing grounds as well as likely result in the non-attainment of downstream water quality standards within the 1873 Survey Area of the Puyallup Reservation. For these reasons, the Tribe will take the following actions:

1. We will oppose all variance applications applied for within the Tribe's Usual & Accustomed fishing grounds.
2. We will take necessary further actions to 1) make sure the final variance policy is at least consistent with the federal water quality standards regulation, including defining and achieving the "highest attainable use" as required.
3. We will take necessary further actions to ensure our treaty fishery and critical habitat are not harmed or adversely impacted.
4. We will make sure adequate safeguards are contained in the rule "to ensure the attainment and maintenance of downstream waters" within the 1873 Survey Area of the Puyallup Reservation.
5. We will request technical assistance from EPA to restore waters under the Tribe's jurisdiction under Section 303(d) of the CWA by effectuating water cleanup plans (Total Maximum Daily Loads – TMDLs).

Shifting uncertainty to the Tribe's treaty fishery and downstream waters is reckless and more importantly, needless because there are existing policies in place that provide sufficient

flexibility for compliance with permits already. The state's existing variance policy provides sufficient flexibility to polluters while keeping with the intent of EPA's 1977 memorandum regarding variances as "temporary", limited to single dischargers, and requiring the same substantive and procedural rigor of removing a use.

The Clean Water Act provides no express authority for states to issue variances. The Act does allow states to authorize general policies for the implementation of water quality standards. The intent for allowing variances is to prevent a permanent downgrade of a use and provide a mechanism for maintaining standards "where attainable". *National Assessment of State Variance Procedures*, U.S. EPA, 1990, available at http://water.epa.gov/scitech/swguidance/standards/upload/1999_11_03_standards_variancereport.pdf. The underlying presumption is that by preventing a permanent downgrade in a designated use, further improvements in water quality will occur. Of course, this is not necessarily true, unless prescriptions are stipulated that define under what circumstances and for how long variances will be in effect. In fact, the legal basis for granting a variance is that the state has fulfilled the same regulatory requirement for removing a designated use. *Water Quality Standards Handbook: Second Edition*, U.S. EPA Office of Water, Washington D.C, 1994, as updated in 2014, available at <http://www.epa.gov/waterscience/library/wqstandards/handbook.pdf>.

The history of the concept of variances dates back to at least the 1980s, when in 1985, the Office of general Counsel indicated that, in addition to the substantial and widespread economic and social impact test that was imposed by regulation, 48 Fed.Reg 51403, Nov. 8, 1983, variances could be granted on any of the factors specified in 40 C.F.R. §131.10(g) for removal of a use. But in addition to these requirements, EPA imposed two additional operating assumptions:

First, variances would not exceed 3 years, the time frame stipulated for the triennial review and the review of any water body segment that does not include the uses specified in Section 101(a)(2) of the CWA, the "fishable/swimmable uses". Second, variances would be granted to an individual discharger. This discharger-specific element evolved because the agency developed the variance mechanism to ensure that permits issued complied with the CWA.

Memorandum from Edwin L. Johnson, Director Office of Water Regulations and Standards to Water Division Directors, entitled "Variances in Water Quality Standards," U.S. EPA, March 15, 1985, available at http://water.epa.gov/scitech/swguidance/standards/upload/2008_08_04_standards_wqsvariance.pdf.

A variance does not replace a waterbody's designated use, but instead merely provides a temporary standard while still preserving the underlying use. It must be based on a use attainability demonstration and targets achievement of the highest attainable use and criteria (or best achievable water quality) during the period of the variance. As such, the variance is a revised water quality standard that must be supported on the basis of the factors specified in 40 CFR §131.10(g), it requires a full public review process, and EPA and approval before it can be used for Clean Water Act purposes. *Variance Compendium*, Oregon Department of Environmental Quality. January 24, 2011, Salem, Oregon. In addition to ensuring the highest level of water quality is attained, every 3 (not 5 as proposed in the rule) years, the state must consider whether there is any new information that may indicate that a 101(a) use is attainable, and if so, revise the WQS accordingly 40 C.F.R. §131.20(a).

EPA continues to substantially limit the duration and scope of variances, while the Proposed Rule broadens the scope of application and provides no timeframe for their expiration. In the public process, variances for durations of 40 years were discussed for some pollutants that would be applicable statewide or to entire watersheds. This timeframe was reportedly based on timeframes for municipal capital budget planning, with no regard for required compliance with the Clean Water Act through achievement of the highest water quality during the interim and preventing the permanent downgrade of the use.

The state's variance proposal and anticipated policy is perhaps the most egregious portion of the state's proposed rulemaking in that it provides a steep and swift off-ramp from the goals and requirements of the Clean Water Act and its implementing regulations. By definition variances are not protective of human health or, in the case of conventional pollutants, not the fishery, and variances pose a significant possibility for the diminishment of the tribe's treaty rights.

Accordingly, in compliance with the Clean Water Act, federal regulations, and to meet the State's obligations to protect tribal treaty rights, the Puyallup Tribe has no recommendations but for making no changes to the existing state policy.

Intake Credits

Current Washington State surface water quality standards rules (Chapter 173-201A WAC) does not include language on the use of intake credits as an implementation tool. The intake credit rule section in the Proposed Rule is new and will be used for the first time in the State of Washington, if approved by EPA. Federal regulations allow for the use of intake credits to be applied to technology-based effluent limitations 40 C.F.R. §122.45(g)). It is essential that the state's water quality standards rule provide a sufficient definition, and specify how and when these tools will be used.

An intake credit is a tool used to account for the level of a pollutant in the intake water of a facility when establishing a permit limit for the effluent of that facility. *See* 40 C.F.R §122.45(g). As typically used in federal permits and other states, intake credits have a limited applicability due to requirements that the intake pollutant must not be altered in such a way as to cause or contribute to an excursion of a water quality standard.

The use and application of intake credits should be narrowly construed to and only applied in circumstances that will not cause or contribute to violations of water quality standards or degrade tribal waters. To avoid potential violations of water quality standards, intake credits should be limited to the following circumstances:

- The facility does not add the intake pollutant of concern
- The facility does not alter the intake pollutant chemically or physically
- When intake of the pollutant of concern comes from the same surface body of water from the immediate vicinity of the discharge.
- When the intake credit is used to demonstrate *compliance with* effluent limitations, as opposed to avoiding the setting of effluent limitations through the Reasonable Potential Analysis review.

The Puyallup Tribe fundamentally has a problem with a facility “bringing in” pollutants via their process and delivering these pollutants into the Tribe’s treaty and jurisdictional waters, namely toxics like arsenic. The facility then gets a “credit” under their permit that in effect allows the facility to violate usually-applicable water quality based limits if it has not added or modified the pollutant. These toxics are carcinogenic, or in the case of other toxics, persistent and often bioaccumulate. These pollutants would not have been otherwise discharged to

receiving waters but for the facility's operations and it is blatantly unconscionable to us to receive a "credit" to discharge these pollutants under a water quality based effluent limit.

Waters under the Tribe's CWA jurisdiction and treaty waters do not have assimilative capacity for many of the pollutants and toxics for which intake credits may apply, such as arsenic. Instead of allowing a known carcinogen be discharged into tribal waters, that would not have been there but for the facility's importation from source ground and surface waters, we have successfully removed arsenic loadings from dischargers effluent by imposing low-limit monitoring programs, process evaluations, and product substitutions.

As a discretionary policy under the CWA, the Tribe intends to prevent the allowance of intake credits in the Puyallup River watershed, as such an allowance will provide for additional loads of toxics discharged that would not have been there otherwise but for the polluters actions specifically "importing" these wastes that are carcinogenic, bioaccumulative, persistent, or act as endocrine disruptors.

Without narrowly construing the definition, scope, and applicability of the proposed Intake Credit language in the Proposed Rule so that an intake pollutant will not "cause or contribute to an excursion of a water quality standard", we find Ecology's Proposed Rule to be arbitrary, capricious, contrary to law, and violates the Tribe's treaty rights.

Protection of Downstream Uses

Pursuant to sections 303 and 101(a) of the Clean Water Act, the federal regulation at 40 C.F.R. §131.10(b) requires that "[i]n designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." This provision requires states and authorized tribes (hereinafter "states/tribes") to consider and ensure the attainment and maintenance of downstream water quality standards (WQS) during the establishment of designated uses and water quality criteria in upstream waters. *See Protection of Downstream Waters in Water Quality Standards: Frequently Asked Questions*, U.S. EPA, EPA-820-F-14-001, 2014, available at <http://water.epa.gov/scitech/swguidance/standards/library/upload/downstream-faqs.pdf>.

Designated uses and criteria that ensure attainment and maintenance of downstream WQS facilitate consistent and efficient implementation and coordination of water quality-related

management actions (e.g., water quality monitoring and assessment, development of Total Maximum Daily Loads (TMDLs) and other watershed-based restoration and protection plans, and National Pollutant Discharge Elimination System (NPDES) permitting and Clean Water Act Section 401 certifications).

Although states have flexibility and discretion as to how this requirement is accomplished, the Tribe prefers this approach. Consistent upstream and downstream uses and criteria provide consistency across jurisdictional waters for the successful management of resources and reduce the likelihood of interjurisdictional disputes. Based on the Proposed Rule, the State of Washington's rules continue to become more and more disparate from Washington Tribe's water quality standards and neighboring states like Oregon. The state's proposed changes to implementing the proposed standards through the use of variances and compliance schedules broaden the chasm between neighboring states and Washington's Tribes. The requirement to protect downstream uses mandates adopting either narrative or numeric criteria to ensure the attainment and maintenance of downstream and preferably, an antidegradation policy and implementation plan that expressly prevents degradation of downstream waters and a plan for assurances.

Specifically, when designating or revising upstream uses specified in Clean Water Act section 101(a)(2), or subcategories of such upstream uses, provisions should include how the state's revised upstream uses (and associated criteria) will continue to demonstrate protection of existing or designated uses of downstream waters. The state has not provided the rationale as to *how* they will ensure downstream tribal and inter-state uses with neighboring states of Oregon and Idaho will be protected, particularly in light of the broadening of the off-ramps from the Clean Water Act provided by authorizing extensive undefined compliance schedules, variances and, intake credits. The Puyallup Tribe would like to obtain assurances from the State of Washington that the integrity of our downstream waters will be maintained and human health and our resources will be protected. Accordingly, we have requested assistance from EPA and cooperation from the State to restore downstream waters of the Tribe under the 303(d) process.

Absent any clear evidence as to how Washington intends to meet the Clean Water Act's obligations regarding downstream waters, the Proposed Rule is arbitrary, capricious, contrary to law, and a violation of the Tribe's Treaty Right.

CONCLUSION

Based upon the extensive discussion and reasons stated herein, the Proposed Rule is arbitrary, capricious and a violation of law. In addition, the Proposed Rule violates the Tribe's Treaty rights. Absent significant changes to address the issues stated herein, Ecology risks significant ongoing litigation, EPA disapproval and subsequent delay in implementing the water quality standards that will protect all citizens of the State of Washington, including tribal people.

References

Agent Orange Association of Canada Inc. *"All You Ever Wanted to Know about Dioxin or Perhaps Really do Not Want to Know"*. January 2009. Website:

<http://agentorangecanada.com/dioxin.php>

CRITFC (Columbia River Inter-Tribal Fish Commission). 1994. *A Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin*. Portland, OR: CRITFC. Technical Report 94-3.

EPA, 2000. U.S. Environmental Protection Agency. 40 CFR Part 131.38 California Toxic's Rule, at <http://www.epa.gov/fedrgstr/EPA-WATER/2000/May/Day-18/w11106.pdf>.

EPA. 2000. *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health*. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 822-B-00-004. Available at: <http://www.epa.gov/waterscience/criteria/humanhealth/method/complete.pdf>

EPA, 2007. U.S. Environmental Protection Agency. *Region 10 Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia*, Working Doc. Available at: [http://yosemite.epa.gov/r10/CLEANUP.NSF/7780249be8f251538825650f0070bd8b/e12918970debc8e488256da6005c428e/\\$FILE/Tribal%20Shellfish%20Framework.pdf](http://yosemite.epa.gov/r10/CLEANUP.NSF/7780249be8f251538825650f0070bd8b/e12918970debc8e488256da6005c428e/$FILE/Tribal%20Shellfish%20Framework.pdf)

EPA 2001. U.S. Environmental Protection Agency. *Water Quality Criterion for the Protection of Human Health: Methylmercury*. EPA-823-R-01-001. EPA 2002.

EPA National Recommended Water Quality Criteria: 2002 – Human health criteria calculation matrix. EPA 822-R-02-012, November 2002.

EPA, 2002. U.S. Environmental Protection Agency. *National Recommended Water Quality Criteria: 2002. Human health criteria calculation matrix*. EPA-822-R-02-012. November 2002. At http://water.epa.gov/scitech/swguidance/standards/upload/2002_12_30_criteria_wqtable_hh_calc_matrix.pdf

EPA. 2009. U.S. Environmental Protection Agency. *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*. EPA 823-R-09-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

EPA 2011. *Exposure Factors Handbook: 2011 Edition*. National Center for Environmental Assessment, Washington, DC; EPA/600/R-09/052F. Available from the National Technical Information Service, Springfield, VA, and online at <http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf>

EPA 2013. *Letter to Chairman Rudy Peone RE: EPA's Action on the Spokane Tribe of Indian's 2010 Revisions to their Surface Water Quality Standards*. Seattle, Washington. http://www.epa.gov/region10/pdf/water/wqs/spokane_cover_letter_TSD_Dec192013.pdf

EPA. 2015. *National Recommend Ambient Water Quality Criteria for the Protection of Aquatic Life and Human Health*. Published pursuant to section 304(a) of the Clean Water Act. Available at: <http://www.epa.gov/waterscience/criteria/wqctable/index.html>

EPA 2015. U.S. Environmental Protection Agency. *Proposed Rule: Revision of certain federal water quality criteria applicable to Washington*. 80 FR No. 177, Monday, September 14, 2015. Pages 55063 – 55077)

EPA. *National Recommend Ambient Water Quality Criteria for the Protection of Aquatic Life and Human Health*. Published pursuant to section 304(a) of the Clean Water Act. Footnote N. Available at: <http://www.epa.gov/waterscience/criteria/wqctable/index.html>

Ecology, 2013. Attachment C: Statistical Analysis of National and Washington State Fish Consumption Data by Nyak Polissar et al. Washington Department of Ecology. *Fish Consumption Rates. Technical Support Document. A Review of Data and Information about Fish Consumption in Washington. Version 2.0 Final*. January 2013. Publication No. 12-09-058. Available at: <https://fortress.wa.gov/ecy/publications/publications/1209058.pdf>

Ecology, 2014. Public meeting held on November 6, 2014 RE: Rulemaking General Information, p.27.

Ecology 2014. Washington Water Quality Standards: Human Health Criteria and Implementation Tools: Overview of key decisions in rule amendment. September 2014 Preliminary Draft.

Ecology 2016. Washington Water Quality Standards: Human Health Criteria and Implementation Tools: Overview of key decisions in rule amendment. January 2016.

Letter to Maia Bellon, Director of the Department of Ecology from Dennis McClerran, Region 10 EPA Administrator on April 8, 2014 RE: Washington State Water Quality Standards Rulemaking.

Letter from, Michael A. Bussell, Director Office of Water and Watersheds, EPA Region 10 to Mr. Barry Burnell Water Quality Programs Administrator Idaho Department of Environmental Quality, May 10, 2012. Available at <http://www.deq.idaho.gov/media/854335-epa-disapproval-letter-human-health-criteria-051012.pdf>

U.S. Department of the Interior, Office of the Solicitor. January 30, 2015. Letter from Hilary C. Tomkins to Avi Garbow, General Counsel, U.S. Environmental Protection Agency. RE: Maine's WQS and Tribal Fishing Rights of Maine Tribes.

U.S. Environmental Protection Agency, Office of Water. February 2, 2015. Analysis Supporting EPA's February 2, 2015 Decision to Approve, Disapprove, and Make No Decision on, Various Maine Water Quality Standards, Including Those Applied to Waters of Indian Lands in Maine. Available at: <https://turtletalk.files.wordpress.com/2015/02/2015-2-2-me-wqs-epa-decision-letter-attachment-a.pdf>

40 CFR §131 (2015). <https://www.regulations.gov/#!documentDetail;D=EPA-HQ-OW-2010-0606-0288>

Coho Returns in the Puyallup Basin and South Puget Sound, prepared by Russ Ladley, Puyallup Tribal Fisheries Biologist (April 2016)

Coho returns to the Puyallup Basin and south Puget Sound were very poor in 2015 and projections for 2016 are even worse. The upcoming fishing season may hold unprecedented changes in harvest regulations. Its highly likely that all Puget Sound coho fishing will be suspended and even targeted Chinook opportunities will be closely watched to avoid unwanted interceptions of both wild and hatchery origin coho. Some Puget Sound river systems are forecast to not meet minimum escapement even without interception fisheries in place!

The specific causes of poor survival are unknown but habitat conditions , whether freshwater, marine or both are certainly the culprit. Coho survival rates for Puget Sound hatchery stocks in particular have plummeted from what they were in the 80's and 90's. Summer rearing flows are one of the key habitat variables affecting freshwater survival of coho and extreme summer water temperatures observed in the summer of 2015 will undoubtedly impact 2016 adult returns. The Voight Creek Hatchery lost 600,000 coho yearlings at the new Orting facility last June and July due to record warm water temperatures in Voight Creek which supplies up to 20-cfs flow for incubation and rearing.

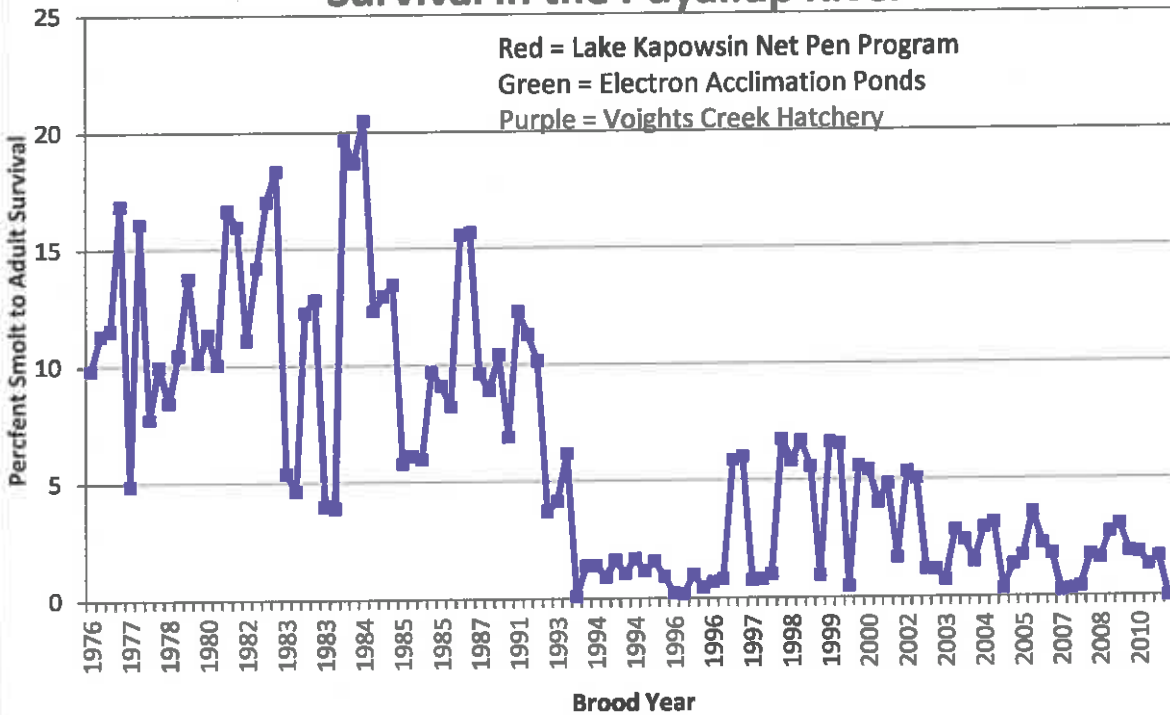
The extreme El Nino event of 2015-16 will greatly affect marine survival rates of coho returning in both 2016 and 2017. Another coho forecasting tool is the Puget Sound Summer Low Flow Index (PSSLFI) that is a composite of eight Puget Sound stream gages and used for Sound wide forecasting models and utilizes the close correlation between summer low flows and freshwater survival.

	Escapement estimates			
	Buckley trap Counts	Nat spawners	Total Nat Esc + Buckley	Voight Creek Hatchery
1973				3,785
1974	1,081	5,271	6,352	20,542
1975	546	1,331	1,877	9,873
1976	833	5,769	6,602	19,883
1977	1,080	9,014	10,094	24,819
1978	487	2,562	3,049	10,663
1979	313	6,131	6,444	7,969
1980	335	6,134	6,469	24,236
1981	1,237	3,800	5,037	17,151
1982	525	1,818	2,343	9,228
1983	406	3,691	4,097	14,608
1984	402	3,197	3,599	15,983
1985	1,363	1,331	2,694	3,646
1986	617	1,101	1,718	13,816
1987	1,940	4,454	6,394	12,928
1988	3,211	969	4,180	5,117
1989	833	480	1,313	20,833
1990	5,804	770	6,574	15,241
1991	4,591	952	5,543	14,955
1992	1,264	636	1,900	52,465
1993	1,387	1,221	2,608	38,095
1994	6,513	2,897	9,410	53,149
1995	2,733	1,967	4,700	41,198
1996	962	5,694	6,656	50,649
1997	7,988	6,068	14,056	18,452
1998	1,789	3,627	5,416	7,597
1999	1,002	2,020	3,022	9,005
2000	21,345	2,899	24,244	39,394
2001	6,022	5,510	11,532	34,298
2002	6,370	1,609	7,979	43,099
2003	16,476	2,237	18,713	35,253
2004	14,341	4,657	18,998	15,004
2005	13,894	4,147	18,041	22,443
2006	8,366	3,467	11,833	2,023
2007	12,719	3,330	16,049	6,878
2008	7,482	2,350	9,832	2,769
2009	9,801	3,986	13,787	5,736
2010	4,556	758	5,314	2,329
2011	23,770	2,466	26,236	4,883
2012	23,795	3,712	27,507	3,540
2013	5,854	3,056	8,910	3,785
2014	9,493	505	9,998	4,406
2015	9,593	353	9,946	6,217

Puyallup River Coho Forecasts

YEAR	WILD	HATCHERY	TOTAL
2001	5,200	51,587	56,787
2002	6,880	58,233	65,113
2003	36,100	87,639	123,739
2004	13,900	54,932	68,832
2005	13,900	55,754	69,654
2006	5,400	56,420	61,820
2007	2,100	36,918	39,018
2008	3,300	33,561	36,861
2009	13,600	31,729	45,329
2010	3,200	7,897	11,097
2011	37,770	17,271	55,041
2012	8,600	23,165	31,765
2013	12,041	26,668	38,709
2014	23,600	14,712	38,312
2015	21,385	18,949	40,334
2016	1,576	7,606	9,182

Percent Smolt to Adult Fall Hatchery Coho Survival in the Puyallup River



Please note in the graph above, the 2012 survival rate is erroneously depicted. The data for 2012 brood year fish have not yet been collected as this cohort returned just last fall. The trend and its cause(s) are clearly the problem but an explanation for the observations remains a mystery. The x-axis brood years that appear twice e.g. 1994, denote two different CWT tag groups of fish released for those years. Puget Sound coho production from hatcheries used to average 10-12% but is presently around 3% or less over the last decade.

The link below focuses on marine oceanographic findings and coho survival that may also be of interest.

<http://www.nwfsc.noaa.gov/research/divisions/fe/estuarine/oeip/g-forecast.cfm>